

City of
ENCINITAS

Final

CLIMATE ACTION PLAN

JANUARY 2018



City of Encinitas

Climate Action Plan

PREPARED BY:

The City of Encinitas

IN CONSULTATION WITH:

Ascent Environmental, Inc.

Energy Policy Initiatives Center

Prepared in partnership with the San Diego Association of Governments (SANDAG) and the Energy Roadmap Program. This Program is partially funded by California utility customers and administered by San Diego Gas & Electric Company under the auspices of the California Public Utilities Commission.

January 2018

RESOLUTION 2018-04

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS APPROVING AND ADOPTING THE UPDATED CITY OF ENCINITAS CLIMATE ACTION PLAN

WHEREAS, that the City of Encinitas is committed to the long-range goal of protecting the natural environment, increasing sustainability efforts, and improving overall quality of life;

WHEREAS, carbon dioxide (CO₂) and other greenhouse gases released into the atmosphere have a profound effect on the Earth's climate and reducing the potential magnitude of climate change may lower its harmful effects on public health and safety;

WHEREAS, achieving greenhouse gas emission reductions to protect the climate is important to the City of Encinitas, which relies heavily on the stability of the climate for our environment, economy, and quality of life;

WHEREAS, in 2006, the State of California adopted the Global Warming Act of 2006 (Assembly Bill 32) which created a statewide greenhouse gas emission requirement and goal to reduce emissions to 1990 levels by 2020; and in 2016, California Senate Bill 32 established a new mid-term greenhouse gas reduction target of 40 percent below 1990 levels by 2030;

WHEREAS, local actions, whenever taken by cities and counties nationwide, can help provide a collective response and may also provide the benefits of testing and developing model programs, methods, and technologies for achieving greenhouse gas reductions;

WHEREAS, on March 9, 2011, the City Council of the City of Encinitas approved and adopted a Climate Action Plan;

WHEREAS, on June 17, 2015, at the recommendation of the Environmental Commission, the City Council of the City of Encinitas directed staff to work with the Environmental Commission to update of the City's Climate Action Plan;

WHEREAS, on February 10, 2016, a temporary acting staff assignment, Climate Action Plan Program Administrator, was established as part of the City's Fiscal Year 2016-17 Work Program to facilitate the update of the City Climate Action Plan;

WHEREAS, on November 21, 2016, SANDAG extended and initiated climate action planning services to the City of Encinitas through its Energy Roadmap Program to support the update of the City's Climate Action Plan;

WHEREAS, the Climate Action Plan update included a revised greenhouse gas emission inventory and forecast, analysis and qualification of updated greenhouse gas

reduction measures and targets, clarification to the process for implementation, monitoring and reporting of progress, and meaningful community engagement.

WHEREAS, four public workshops were hosted by the City of Encinitas and an online forum was set up to gather public input during the update of the Climate Action Plan;

WHEREAS, the updated Climate Action Plan includes a set of Strategies, Goals, Emission Reduction Targets, City Actions, Supporting Measures and Adaptation Strategies based on regional climate planning and consulting expertise, City staff knowledge, and Environmental Commission and public input;

WHEREAS, an Environmental Initial Study determined that the Climate Action Plan would not have a significant impact on the environment;

WHEREAS, a Negative Declaration was prepared for the Climate Action Plan and so deems the document a California Environmental Quality Act Qualified Climate Action Plan;

WHEREAS, greenhouse gas reduction actions contribute to the achievement of many of the City's environmental values and are consistent with the City's Environmental Policy, including promoting clean and efficient energy use, transitioning to greater proportion of renewable electricity sources, reducing vehicle miles traveled and promoting active transportation, implementing an organic waste recycling program and diverting solid waste from the landfill; promoting water conservation; and planning for anticipated future climate change impacts;

WHEREAS, many of the components of the updated Climate Action Plan are under development or are currently being implemented by the City of Encinitas, including the Green Building Program, the condensed City employee work schedule, Public Transportation Commuter Reimbursement Policy, among others; and

WHEREAS, mechanisms employed and installed to reduce greenhouse gas emissions will also contribute to the economic vitality of the City through the development and use of clean technologies and the addition of local jobs.

NOW, THEREFORE, BE IT RESOLVED, DETERMINED AND ORDERED by City Council of the City of Encinitas that:

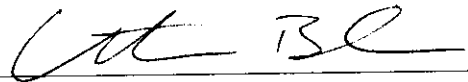
1. The updated Climate Action Plan is a California Environmental Quality Act Qualified Climate Action Plan.
2. Based on its consideration, the City Council hereby determines that the adoption of the Climate Action Plan is consistent with the provisions of the General Plan, the Local Coastal Program Land Use Plan, State law, and is in the public interest.
3. It is also understood that where City Actions, Supporting Measures, or Adaptation Strategies require ordinance or zoning code amendments further evaluation and analysis will be conducted to determine adequacy prior to implementation.

BE IT FURTHER RESOLVED that the City will pursue the greenhouse gas emission reduction goals and targets identified in the Climate Action Plan through the implementation of the identified City Actions and by encouraging the community to support Climate Action Plan goals and targets through various actions, ordinances, policies, incentive-based programs, and education programs.

BE IT FURTHER RESOLVED that the City will monitor and report progress towards meeting greenhouse gas emission reduction goals and targets identified in the Climate Action Plan. Since all levels of government continue to monitor, lead and participate in activities, it may be necessary to adjust the measures described therein as necessary to ensure Assembly Bill 32 and other related legislation is fully implemented.

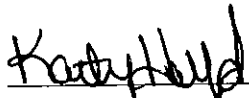
PASSED AND ADOPTED this 17th day of January, 2018, by the following vote, to wit:

AYES:	Blakespear, Boerner Horvath, Kranz, Mosca, Muir
NAYS:	None
ABSENT:	None
ABSTAIN:	None



Catherine S. Blakespear, Mayor
City of Encinitas

ATTEST:



Kathy Hollywood, City Clerk

ACKNOWLEDGEMENTS



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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
AB	Assembly Bill
BAU	business-as-usual
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
CalOES	California Office of Emergency Services
CAP	Climate Action Plan
CARB	California Air Resources Board
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	chlorofluorocarbons
CH ₄	methane
City	City of Encinitas
CNG	Compressed Natural Gas
CNRA	California Natural Resources Agency
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CoSMoS	Coastal Storm Modeling System
CSE	Center for Sustainable Energy
DWR	Department of Water Resources
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPIC	Energy Policy Initiatives Center
EVs	Electric vehicles
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GWP	global warming potential
HFCs	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
kWh	kilowatt hours
MHMP	Multi-Jurisdictional Hazard Mitigation Plan

Acronyms and Abbreviations

MPOs	Metropolitan Planning Organizations
MTCO ₂ e	metric tons of carbon dioxide equivalent
N ₂ O	nitrous oxide
O ₃	ozone
OMWD	Olivenhain Municipal Water District
OPR	Office of Planning and Research
PACE	Property Assessed Clean Energy
PFCs	perfluorocarbons
ppm	parts per million
PVs	photovoltaics
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric
SDWD	San Dieguito Water District
UHIE	Urban Heat Island Effect
USGS	U.S. Geological Surveys
UWWUI	urban-wildland interface
VMT	Vehicle Miles Traveled



Executive Summary

A Climate Action Plan provides a comprehensive roadmap to address the challenges of climate change in the City of Encinitas (City). To combat the effects of climate change, the City will need to reduce greenhouse gas (GHG) emissions from activities within the City while supporting the community in adapting to and improving its resiliency to a changing climate over the long term. The City previously developed a CAP in 2011 (2011 CAP) based on a 2005 baseline inventory. The 2018 CAP has been prepared as an update to the 2011 CAP to account for new legislation, improved technology, and a more recent baseline inventory year of 2012.

The scientific consensus is that there is substantial evidence that human activity is the causal agent of global climate change and that significant reductions in human-caused GHG emissions are needed by the mid-21st century to prevent the most catastrophic effects of climate change (Intergovernmental Panel on Climate Change [IPCC] 2014). To this end, in 2006, the California Global Warming Solutions Act (Assembly Bill [AB] 32) established the State’s first target to reduce GHG emissions, which established a goal of lowering emissions to 1990 levels by 2020. California has been making steady progress and is expected to achieve the 2020 target through actions outlined in the California Air Resources Board (CARB) Scoping Plan; however, ongoing reductions in GHG emissions are needed.

In 2016, Governor Brown signed Senate Bill (SB) 32 into law, which established a new mid-term GHG reduction target of 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. The new 2030 target places California on a trajectory towards meeting its longer-term goal, which is to bring emissions down to 80 percent below 1990 levels by 2050.

In its Scoping Plan, CARB recognizes local governments as “essential partners” in achieving California’s goals to reduce GHG emissions. Local governments can implement climate strategies to address local conditions and issues, and can engage citizens more effectively than the State. Local governments have broad jurisdiction and in some cases, unique authorities, through community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and local government operations. CARB contends that local government efforts are critical to supporting the State’s efforts to reduce emissions and can ultimately deliver additional emissions reductions beyond what State policy can, along with local economic benefits (CARB 2017). Climate action plans are an effective way for local governments to support the State in its GHG reduction efforts.

The key components of the climate action planning process are shown in Figure ES-1 and briefly summarized below:

1. Prepare a baseline GHG emissions inventory (provided in Chapter 2)

- The baseline year of 2012 was established for the 2018 CAP.
- Approximately 483,773 metric tons of carbon dioxide equivalent (MTCO₂e) were emitted by communitywide sources in the City in 2012.
- The largest source of emissions was the on-road transportation sector which accounted for 54 percent of the inventory; the electricity sector, the next largest, accounted for approximately 23 percent of the inventory.

GHG Emission Sectors in 2012
Baseline Inventory:

1. On-Road Transportation (54%)

2. Electricity (23%)

3. Natural Gas (13%)

4. Solid Waste (5%)

5. Water (3%)

6. Off-Road Transportation (2%)

7. Wastewater (0.4%)

Note: Values may not add to totals due to rounding

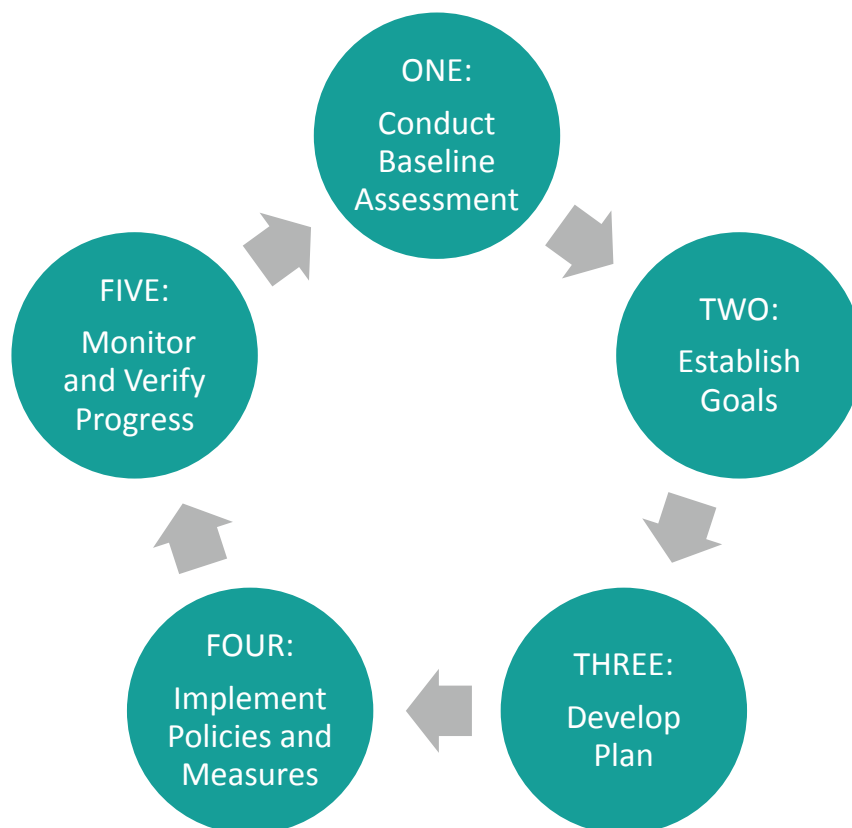


Figure ES-1: Climate Action Planning Milestones

2. Calculate GHG emissions forecasts and develop reduction targets (provided in Chapter 2)

- Future emissions were estimated based on business-as-usual (BAU) conditions. Without any actions taken by the City, GHG emissions are expected to increase by 2020 and 2030.
- GHG emissions reduction targets for the 2018 CAP were established consistent with State guidance:
 - Reduce emissions 13 percent below 2012 baseline levels by 2020; and
 - Reduce emissions 41 percent below 2012 baseline levels by 2030.
- Legislative actions by federal or State agencies help to reduce emissions in the future but are not sufficient to achieve the 2020 and 2030 targets.
- Achieving the 2020 and 2030 targets will require local action to help close the gap between legislative-adjusted emissions forecasts and the emissions limits established by the 2018 CAP targets.

The 2018 CAP contains a total of 19 local GHG reduction actions. The combination of all actions contributes towards achieving the 2020 and 2030 targets.

3. Identify local GHG emissions reduction strategies, goals, actions, and supporting measures to help the City achieve the 2020 and 2030 targets (provided in Chapter 3).

- GHG reduction strategies in the 2018 CAP are aligned with the GHG inventory sectors and include a total of 19 specific local GHG reduction actions.
- The top three actions in the 2018 CAP that will achieve the highest local GHG emissions reductions include:

- City Action RE-1: Establish a Community Choice Energy Program. This action will reduce emissions by 43,644 MTCO₂e by 2030.
- City Action ZW-1: Implement a Zero Waste Program. This action will reduce emissions by 2,830 and 11,921 MTCO₂e by 2020 and 2030, respectively.
- City Action CET-3: Improve traffic flow, promote active transportation, and plan for complete streets. This action would reduce emissions by 3,671 and 2,839 MTCO₂e by 2020 and 2030, respectively.

The top three GHG reduction actions will reduce City emissions by a total of 6,501 and 58,404 MTCO₂e by 2020 and 2030, respectively.

- Each strategy is supported by a number of non-quantifiable supporting measures. These are programs, policies, or projects the City will implement that will have an indirect effect on GHG emissions reductions.
- While the actions and supporting measures in the 2018 CAP are generally geared towards reducing GHG emissions, many will also result in health, environmental, and/or economic “co-benefits,” in addition to climate adaptation co-benefits.

Co-benefits are the collateral positive side effects that result from GHG reducing strategies and actions identified in the CAP.

4. Develop implementation and monitoring mechanisms that will help the City ensure the goals and targets are achieved (provided in Chapter 4).

- Implementation of the actions and measures in the 2018 CAP will require the City to develop and implement new ordinances, programs, and projects, or modify existing ones. This will require careful consideration of the operational and capital resources needed, as well as the timing and phasing of implementation. Chapter 4 outlines these considerations.
- Monitoring is an important aspect of the 2018 CAP to ensure that the City is on track to achieve the GHG reduction targets and desired outcomes for increasing resilience in the face of a changing climate. To this end, the City will need to review and update the GHG emissions inventory periodically (every two years), track the community’s progress on the implementation status of each action in the 2018 CAP, and conduct future CAP updates periodically (every five years).

Climate change is a global problem but one that must be addressed at the local level through partnerships and individual actions.

- Local action on climate change cannot be addressed insularly by one agency or community, but requires active and ongoing partnerships between residents, businesses, the City, and other agencies and organizations in the region. On a communitywide level, individuals and businesses can play an important role in combating climate change. By changing habits to consume less energy; producing less waste through recycling, organics processing, and conserving water; and driving less by choosing to carpool, take transit, or walk and bike more frequently, individuals and businesses can work towards reducing their carbon footprint. The combination of these small efforts can lead to better outcomes for the environment and the City.
5. Address climate change vulnerability with adaptation strategies that would improve community sustainability and resilience.
- Specific adaptation strategies are included in Chapter 5 to address the effects of climate change. Many of the strategies require the City and other partnering agencies to address climate-related risks as part of existing planning processes, as well as making incremental changes in the way City services and infrastructure are maintained and operated. Community education and awareness-building are also important components of the adaptation strategies.



CHAPTER 1

Introduction

1.1 Climate Action Plan Overview

Climate Action Plans (CAPs) serve as comprehensive roadmaps that outline the specific activities that a community and municipality will take to reduce greenhouse gas (GHG) emissions and the potential impacts of climate change within the borders of a jurisdiction. In developing a CAP, jurisdictions evaluate the volume of GHGs emitted during a baseline year (2012 for this CAP) and determine the amount of emissions that need to be reduced to achieve statewide GHG reduction targets (discussed in further detail in Section 1.3, “Regulatory Framework”).

2011 CAP

In March of 2011, the City of Encinitas (the City) adopted the *City of Encinitas Climate Action Plan* (2011 CAP) to provide guidance to the City to achieve statewide reduction targets and to respond and adapt to the impacts of climate change. In 2009, the City partnered with members of the San Diego Regional Climate Protection Initiative, local governments in the County of San Diego, and Local Governments for Sustainability (ICLEI) to discuss how the region was going to monitor and address global climate change. This partnership facilitated the City’s initial GHG inventory for the year 2005, which served as the 2011 CAP’s baseline year. The 2005 baseline totaled 548,993 metric tons of carbon dioxide equivalent (MTCO₂e) emissions per year, or 8.78 MTCO₂e per year per capita. Under a business-as-usual (BAU) scenario which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions to reduce GHG emissions, the 2011 CAP determined that the City’s GHG inventory for 2020 would be 646,947 MTCO₂e per year or 9.5 MTCO₂e per year per capita. To achieve consistency with federal and State GHG reduction goals, the CAP specified that the City would reduce emissions 12 percent below 2005 levels by 2020, equivalent to reducing emissions by 164,159 MTCO₂e in 2020.

2018 CAP

The 2018 CAP builds upon the goals of the 2011 CAP and provides a more recent inventory for the City (2012). As discussed in greater detail in Chapters 2 and 3, the inventory performed for 2012 demonstrated that the activities within the City emitted 483,773 MTCO₂e. Consistent with recommendations from the Assembly Bill (AB) 32 2008 Scoping Plan, the City must achieve a 13 percent reduction from 2012 levels by 2020 and a 41 percent reduction by 2030 to be in line with the statewide targets discussed in Section 1.3. This equates to reducing emissions by 53,232 MTCO₂e by 2020 and 197,724 MTCO₂e by 2030.

The 2018 CAP organizes strategies, goals, and actions based on the sectors evaluated in the 2012 inventory (i.e., on-road transportation, electricity, natural gas, solid waste, water, off-road transportation, and wastewater). Strategies were developed to target improving the GHG efficiency of citywide community and municipal activities. For example, GHG reductions will be made through the incorporation of renewable energy in residential and nonresidential buildings while simultaneously improving the efficiency of such buildings. Specific actions and their supporting measures are outlined in Chapter 3 and their reductions disclosed.

The 2018 CAP represents an important step in acknowledging global climate change and its effects on the City. Chapter 2 includes details on the City’s baseline emissions inventory and projections, and establishes reduction targets for 2020 and 2030. Chapters 3, 4, and 5 of the 2018 CAP include strategies, specific actions and supporting measures, and implementation and monitoring mechanisms to reduce GHG emissions and plan for climate change impacts. A more detailed comparison of the 2011 and 2018 CAPs is provided in Appendix C.

1.2 Introduction to Climate Change Science

The greenhouse effect results from the concentration of atmospheric gases referred to as GHGs, which insulate the Earth and help regulate its temperature. The most prevalent GHGs in our atmosphere include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), chlorofluorocarbons (CFCs), and hydrofluorocarbons (HFCs). These gases serve as global insulators, reflecting Earth's visible light and infrared radiation to keep temperatures on Earth stable. Without the greenhouse effect, Earth would not be able to support life as we know it.

Over the past two decades, human activities (e.g., the burning of fossil fuels for transportation and energy, increasing rates of deforestation and development) have contributed to elevated concentrations of GHGs in the atmosphere. Human-caused (i.e., anthropogenic) emissions of GHGs have resulted in above-normal ambient concentrations of GHGs, intensifying the greenhouse effect, and leading to a trend of abnormal warming of the Earth's climate known as *global climate change*. There is a strong scientific consensus that there is substantial evidence to indicate that most of the changes in the Earth's climate during the last 50 years are a result of anthropogenic GHG emissions (Intergovernmental Panel on Climate Change [IPCC] 2014: 3, 5). Global climate change, in turn, is the driver behind changes in precipitation patterns, rising temperatures, shrinking polar ice caps, sea-level rise, and other impacts to biological resources and humans. Chapter 3 of the 2018 CAP summarizes the City's GHG emissions and local contribution to global climate change.



Climate change is a global problem and can lead to significant fluctuations in regional climates. While there is consensus that global climate change is occurring and that it is exacerbated by human activity, there is less certainty as to the timing, severity, and potential consequences of climate change phenomena, particularly at the local level. Chapter 5 of the 2018 CAP discusses the predicted climate change effects in the City and recommends strategies to adapt to climate change.

1.3 Regulatory Framework

In response to the threat of global climate change, the State and City have already taken several steps to both reduce GHG emissions and adapt to climate change. These efforts, and the legislative background summarized in the following sections, provide important policy drivers and context for the 2018 CAP.

1.3.1 California

In 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, which directed California to reduce GHG emissions to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. A year later, in 2006, the Global Warming Solutions Act (Assembly Bill [AB] 32) was passed, establishing regulatory, reporting, and market mechanisms to achieve quantifiable reductions in

GHG emissions. AB 32 put a cap on GHG emissions, setting a target of reducing GHG emissions to 1990 levels by 2020. As part of its implementation of AB 32 and EO S-3-05, the California Air Resources Board (CARB) developed a Scoping Plan in 2008. The Scoping Plan, along with its update in 2014, describes the approach California will take to reduce GHGs to achieve reduction targets and goals. California is currently on track to meet or exceed the AB 32 current target of reducing GHG emissions to 1990 levels by 2020.

On April 20, 2015, Governor Edmund G. Brown Jr. signed EO B-30-15, establishing a new GHG emissions reduction target of 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. EO B-30-15 also directed CARB to update the AB 32 Scoping Plan to reflect the path to achieving the 2030 target. In September 2016, Governor Brown also signed Senate Bill (SB) 32, which codified into statute the mid-term 2030 target established by EO B-30-15. The new 2030 GHG emissions reduction target places California on a trajectory towards meeting the goal of reducing statewide emissions to 80 percent below 1990 levels by 2050.

On December 14, 2017, CARB released the final *2017 Climate Change Scoping Plan Update* (2017 Scoping Plan Update), which lays out the framework for achieving the 2030 reductions as established in EO B-30-15 and SB 32. The 2017 Scoping Plan Update identifies GHG reductions by emissions sector to achieve a statewide emissions level that is 40 percent below 1990 levels by 2030.

In addition to legislation setting statewide GHG reduction targets, SB 375, signed by Governor Schwarzenegger in 2008, better aligned regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocations in each MPO's Regional Transportation Plan (RTP). CARB, in consultation with the MPOs, provides each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035. The San Diego Association of Governments (SANDAG) adopted *San Diego Forward: The Regional Plan* that integrates the RTP and SCS in October 2015.

To effectively address the challenges that a changing climate will bring, the State also prepared the 2009 California Climate Adaptation Strategy, which highlights climate risks and outlines possible solutions that can be implemented throughout the State. This Strategy was updated in 2014 and is now known as *Safeguarding California*. In 2015, the State also developed the Safeguarding California Implementation Action Plans.

Other federal and State regulations relevant to the 2018 CAP are identified below:

Table 1-1 Relevant Federal and State Regulations

Federal	Federal Clean Air Act (CAA)	In 2007, the U.S. Supreme Court ruled that CO ₂ is an air pollutant as defined under the CAA, and the U.S. Environmental Protection Agency has the authority to regulate emissions of GHG.
Federal	Corporate Average Fuel Economy (CAFE) Standards	The federal CAFE Standards determine the fuel efficiency of certain vehicle classes in the U.S.
State	SB 97	The State Office of Planning and Research prepared, and the Natural Resources Agency adopted, amendments to the State California Environmental Quality Act (CEQA) Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address global climate change impacts in the CEQA process; State CEQA Guidelines Section 15064.4 was also added to provide an approach to assessing impacts from GHGs.
State	Executive Order S-21-09	Executive Order S-21-09 directed CARB, under its AB 32 authority, to adopt a regulation by July 31, 2010 that sets a 33 percent renewable energy target as established by Executive Order S-14-08.
State	Executive Order S-01-07	Executive Order S-01-07 set forth a low carbon fuel standard for California, whereby the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.
State	California Building Efficiency Standards Title 24 Part 6	The California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.
State	AB 1493	AB 1493 (Pavley) required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks.
State	AB 197	AB 197 creates a legislative committee to oversee CARB and requires CARB to take specific actions when adopting plans and regulations pursuant to SB 32 related to disadvantaged communities, identification of specific information regarding reduction measures, and information regarding existing GHGs at the local level.
State	SB 350	SB 350 requires the State to set GHG emission reduction targets for the load-serving entities through Integrated Resource Planning. SB 350 requires an increase in the Renewable Portfolio Standard to 50 percent by 2030 and doubling energy savings in electricity and natural gas end uses.
State	Advanced Clean Cars Program	In January 2012, CARB approved the Advanced Clean Cars program, which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025.
State	SB X1-2	SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 mandates that renewables supplied to the California grid from sources within, or directly proximate to, California make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.
State	SB 379	Beginning January 1, 2017, SB 379 requires California cities and counties, upon the next revision of their local hazard mitigation plan, to include climate adaptation and resiliency strategies in the safety elements of their general plans. The bill requires the safety element update to include a set of goals, policies, and objectives for their communities based on a vulnerability assessment, as well as implementation measures to increase community resilience to climate change. The safety element update can incorporate these components by reference from an adopted local hazard mitigation plan and/or climate adaptation plan.

1.3.2 City of Encinitas

The City is actively engaged in addressing climate change, sustainability, and reductions in GHG emissions. The 2011 CAP quantified GHG emissions for 2005 and provided a forecast for 2020. Based on this analysis, the City adopted both GHG reduction and climate change adaptation measures to demonstrate consistency with statewide goals set forth in AB 32.

The 2011 CAP included six strategies from the transportation, residential building, non-residential building, solid waste, water, and municipal operations sectors. Examples of GHG- reducing actions adopted as a component of the 2011 CAP include the deployment of a Bikeway Master Plan and a Green Building Incentive Program, new requirements for inclusion of solar photovoltaics for residential and non-residential buildings, and inclusion of transportation demand management strategies for municipal operations. These measures, as well as others not listed here, have been or are in the process of being implemented.



The 2018 CAP builds upon this past effort by creating a GHG inventory for 2012 and forecasting emissions for 2020, 2030, and 2050 consistent with current legislated targets and State Executive Order goals. City actions and supporting measures for the 2018 CAP were developed, in part, by evaluating the 2011 CAP measures to assess their current applicability and relevance. Reduction measures from the 2011 CAP were significantly reworked, while obsolete measures were removed and replaced with new actions and supporting measures. City actions and supporting measures in the 2018 CAP include applicable measures from the 2011 CAP and new actions and measures necessary to meet the 2020 and 2030 GHG reduction targets. A comparison of measures and actions from the 2011 and 2018 CAPs is provided in Appendix C.

Relationship to CEQA

CEQA is a statute that requires local agencies to identify significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. In 2007, California’s lawmakers enacted SB 97, which expressly recognizes the need to analyze GHG emissions as part of the CEQA process. SB 97 required the Governor’s Office of Planning and Research (OPR) to develop recommended amendments to address GHG emissions as an environmental effect.

CAPs are considered a “project” subject to compliance with CEQA because they are activities undertaken by a public agency that are subject to discretionary approval and may cause direct or indirect effects on the environment. SB 97 clarified that GHG emissions are within the scope of environmental review. CAPs include strategies that can change the physical environment and influence development patterns that affect GHG emissions.

In response to the mandate of SB 97, the CEQA Guidelines (specifically Section 15183.5) establish standards for the contents and approval process of plans to reduce GHGs. With associated CEQA coverage, the 2018 CAP has been prepared consistent with those standards. As a CEQA Section 15183.5-qualified plan, the 2018 CAP affords development applicants the opportunity to use CEQA

streamlining tools for analysis of GHG emission and related impacts for projects that are consistent with the 2018 CAP.

1.4 Community Action and Co-Benefits

While global change is happening worldwide, local efforts to reduce human-induced GHG emissions and build resilience in the face of adverse climate change effects can make a difference. Local action on climate change cannot be addressed insularly by one agency or community, but requires active and ongoing partnerships between residents, businesses, the City, and other agencies and organizations in the region. By beginning to plan now and engaging in more sustainable practices, communities will be better suited to adapt to climate change and be more resilient in the future.

At the regional and local scale, individuals and businesses can play an important role in mitigating climate change. Individuals and businesses can work towards reducing their carbon footprint by changing habits to consume less energy, generate less waste through recycling and composting, conserve water, and drive less by choosing to carpool, take transit, or walk and bike more frequently. The combination of these small efforts can lead to better outcomes for the environment and the City.

Effective and long-term climate action and resiliency in the City can only be achieved through efforts that continue to change the way individuals interact with the environment. The 2018 CAP serves as a resource and starting point to support long-term community sustainability efforts. The City is committed to implementing the action to advance equality and reduce disparities. Opportunities to participate and share the benefits of the City's actions will be inclusive for all City residents. For instance, incentive programs to implement City actions and supporting measures will be available to all City residents, regardless of income levels. In addition, the City will promote existing State and local incentive programs specifically targeted towards low-income communities. Impacts of climate change can disproportionately affect disadvantaged communities and the City will work to proactively identify them and implement strategies to reduce impacts. Additional detail will be provided in an implementation plan developed in early Fiscal Year (FY) 2017-18.

While the actions and supporting measures included in the 2018 CAP are generally geared towards reducing GHG emissions, many will also result in environmental or economic “co-benefits.” Environmental co-benefits include improvements to air quality, water supplies, and biological resources; public health outcomes; and beneficial outcomes for other resources. For example, a significant co-benefit of implementing 2018 CAP strategies related to reductions in motor vehicle use and associated fuel combustion will result in fewer toxic air contaminants, leading to better air quality and improved health for everyone. Other strategies focus on improving energy and water-use efficiency in new and existing buildings, lowering overall housing and operation costs for residents and businesses.

Co-benefits are the complementary, positive side effects that would result from strategies, actions, and measures identified in the CAP.

1.5 Climate Action Plan Update

The City's 2011 CAP was adopted by council on March 9, 2011 to serve as a guiding document that outlines the course of action for identifying and implementing strategies to achieve citywide reductions in GHG emissions for both municipal and community operations. The 2011 CAP was designed to:

- Benchmark where the City currently stands relative to statewide emission goals.
- Provide a roadmap for achieving statewide GHG emissions reduction targets.
- Create a plan that meets specific city-wide needs and objectives.
- Provide guidance for the City to respond and adapt to the impacts of climate change.

In January 2016, the update of the City's Climate Action Plan was included in the City's FY 2015-16 and 2016-17 Work Program and in March 2016, staff was assigned to update the plan.

1.5.1 Climate Action Plan Update Elements

The 2018 CAP outlines a course of action for the City to reduce community-wide GHG emissions, as well as prepare for and adapt to climate change.

The overarching goals of the 2018 CAP are to:

- Reduce GHG emissions from the on-road transportation, electricity, natural gas, solid waste, water, off-road, and wastewater sectors
- Identify adaptation strategies for City government, businesses, and residential sustainability

The GHG reduction targets for the City were developed based on State goals embodied in AB 32, SB 32, and EOs B-30-15 and S-3-05. The 2018 CAP aims to achieve the following local community-wide GHG reduction targets:

- 13 percent below 2012 levels by 2020
- 41 percent below 2012 levels by 2030

To achieve these objectives, the 2018 CAP identifies the following:

- A summary of baseline GHG emissions and the potential growth of these emissions over time
- The expected climate change effects on the City
- GHG emissions reduction targets and goals to reduce the community's contribution to global warming
- Identification of strategies, specific actions, and supporting measures to comply with statewide GHG reduction targets and goals, along with strategies to help the community adapt to climate change impacts.

As part of the 2018 CAP implementation, each strategy, action, and supporting measure will be continually assessed and monitored. Reporting on the status of implementation of these strategies, periodic updates to the GHG emissions inventory, and other monitoring activities will help to ensure that the 2018 CAP is making progress. See Chapter 4 for more information on administering, implementing, and monitoring the 2018 CAP.

1.5.2 Climate Action Plan Update Process

As part of the 2018 CAP update, the City developed and implemented a Public Outreach and Engagement Plan (included as Appendix D) providing local residents, stakeholders, interested parties, and other agencies and/or individuals with the opportunity to participate in the climate action planning process. The goals of outreach and engagement are to: (1) raise awareness of the 2018 CAP update; (2) educate the public and other organizations about the 2018 CAP; (3) provide opportunities for input at the various steps of 2018 CAP development; (4) provide opportunities to influence decision-making; and (5) provide a public process that meets the CEQA Guidelines' requirements for a Plan for the reduction of GHG emissions. The rationale for each of these goals includes the following principles:

- *Awareness* – Stakeholders must be aware of the planning process before they can participate.
- *Education* – Stakeholders must be educated and knowledgeable about the 2018 CAP and planning process before they can participate effectively.
- *Input* – Stakeholders' knowledge and perspectives help the planning team verify or expand on available information.
- *Decision-making* – Stakeholders are encouraged to engage in the decision-making process.
- *Open and public process* – As stated in CEQA Guidelines Section 15183.5 (b)(1)(F), a “qualified” GHG reduction plan must be adopted in a public process. Once adopted, the updated 2018 CAP would represent a qualified plan for reduction of GHG emissions, consistent with the requirement set forth in the *CEQA Guidelines* section cited above, and would support tiering of future development projects for purposes of CEQA review of GHG impacts.



Having a clear process by which the public can be involved, review, and comment on the 2018 CAP resulted in a better document that can be used to streamline CEQA analysis and compliance for many types of projects in the City.

2018 CAP Workgroup Meetings

Internal feedback and review was facilitated through the CAP Workgroup. The CAP Workgroup is composed of staff members of the following departments: City Manager's Office, Development Services, Public Works, Human Resources, Information Technology, Finance, San Dieguito Water District, Parks, Recreation and Cultural Arts, and Fire and Marine Safety. The CAP Workgroup's

responsibilities include reviewing and providing comments and recommendations for key work products; providing recommendations for the feasibility of 2018 CAP measures; and using local expertise to offer recommendations of new and revised 2018 CAP measures and goals. The CAP Workgroup met biweekly through the CAP update process to serve these functions.

Environmental Commission and City Council Meetings

At the Environmental Commission's regular monthly meetings, the CAP Program Administrator briefed the commission on the status and progress of the Climate Action Plan update process. In these meetings, the Environmental Commission discussed preliminary GHG results, proposed reduction targets, and the preliminary list of GHG reduction actions and provided comments to staff. The Environmental Commission also convened their Ad-Hoc Subcommittee on the Climate Action Plan Update to review draft elements of the 2018 CAP update and provide recommendations. The Environmental Commission reviewed the draft list of City Actions and Supporting Measures on May 11, 2017 and unanimously approved the list with minor revisions. The draft list forms the foundation of the 2018 CAP update. City Council members were briefed on 2018 CAP update progress at Council meetings on January 18 and April 26, 2017.

Public Workshops

The City hosted two public workshops on February 21 and March 1, 2017 to share information with the community on the 2018 CAP and to receive public input on specific measures and actions that the City can implement to reduce GHG emissions. These workshops have been centered on a number of posters that provided an overview of potential actions and measures that the City can implement to engage 2018 CAP strategies and accomplish goals. Additionally, on February 21, 2017, a PlaceSpeak topic was posted to gather public input using an online platform, to provide the same information on the 2018 CAP process, and receive input on the proposed reduction strategies; identical to those evaluated at the public workshops. All comments received were tracked and evaluated for inclusion in the 2018 CAP. A majority of comments were incorporated into the 2018 CAP. See Appendix E for a summary of public input received.

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CHAPTER 2

Greenhouse Gas Emission Inventory, Projections, and Targets

This chapter summarizes the community's contribution to global climate change by offering a detailed accounting of greenhouse gas (GHG) emissions within the City of Encinitas (City). It includes a discussion of the primary sources and annual levels of GHG emissions from 2012 (i.e., baseline inventory); describes likely trends if emissions are not reduced for 2020, 2030, and 2050 (i.e., projections); and sets a roadmap forward to reduce emissions for 2020 and 2030 (i.e., targets). Emissions from community activities are discussed in Sections 2.2 through 2.4.

2.1 Why Prepare a Greenhouse Gas Emissions Inventory?

Recent increases in global temperatures are highly correlated with elevated GHG emissions resulting from human activities. Per the scientific community, to avoid “dangerous climate change” in the Earth's climate system, GHG emissions will need to be stabilized so that global temperatures do not increase more than 3.6 degrees Fahrenheit (°F) (2 degrees Celsius [°C]) above pre-industrial levels. To achieve this outcome, global carbon dioxide (CO₂) concentrations must be stabilized at 450 parts per million (ppm) (Intergovernmental Panel on Climate Change [IPCC] 2014).

The inventory baseline is used to:

- Project emissions
- Develop reduction targets
- Develop, evaluate, and implement strategies to achieve the targets

One of the main objectives of the 2018 Climate Action Plan (2018 CAP) is to identify and reduce local contributions to global GHG emissions. This chapter is intended to serve as a foundation for the strategies and actions that will implement the City's commitment to reduce emissions. Measuring GHG emissions is a critical first step in developing the 2018 CAP for several reasons. First, the GHG inventory identifies major sources and quantification of GHG emissions associated with the activities and choices currently made by residents, businesses, and municipal operations. Second, the inventory provides the baseline that is used to project emissions trends and to develop accurate reduction targets and interim goals consistent with State objectives. Finally, the inventory sets the baseline for the City to develop, evaluate, and implement strategies and actions to achieve its targets and goals.

The GHG emissions inventory also plays a role in ensuring that the City stays on course to meet the GHG reduction targets. After the 2018 CAP is adopted, the City will prepare regularly updated GHG emissions inventories that will be compared to the baseline inventory. This will track the City's progress in reducing emissions as 2018 CAP actions are implemented.

The emissions inventory is limited to GHGs that are generated from activities within the City from a defined set of sources (e.g., electricity and natural gas use, transportation, waste) that can be readily monitored and reduced through quantifiable City actions.

The inventory establishes 2012 as the baseline year from which the City determines GHG reduction targets. The baseline year aligns with the base year for the San Diego Association of Governments (SANDAG) travel demand model. Appendix A provides additional information on baseline year selection and inventory methodologies.

2.2 Baseline Inventory

The first step in the City's climate action planning process is to understand the sources and amount of GHG emissions generated from activities occurring within the City. A GHG emissions inventory is an estimate of the emissions of a defined set of gases (e.g., CO₂, methane [CH₄], nitrous oxide [N₂O]) that contribute to global climate change. The emissions inventory prepared for the 2018 CAP is limited to emissions that are generated from activities within the City from a defined set of sources (e.g., transportation, electricity use, waste disposal, etc.). These include emissions that are within the City's jurisdictional control and can be readily estimated, monitored, and reduced by City action while supporting the efforts of residences and businesses.

The City's previous CAP (2011 CAP), developed the initial GHG inventory for the year 2005. The 2005 baseline totaled 548,993 metric tons of carbon dioxide equivalent (MTCO₂e) per year, or 8.78 MTCO₂e per year per capita. Under a business-as-usual (BAU) scenario which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions to reduce GHG emissions, the 2011 CAP determined that the City's GHG inventory for 2020 will be 646,947 MTCO₂e per year or 9.5 MTCO₂e per year per capita. To achieve consistency with federal and State GHG reduction goals, the 2011 CAP specified that the City will be required to reduce emissions 12 percent below 2005 levels by 2020, equivalent to reducing emissions by 164,159 MTCO₂e in 2020. The 2005 inventory was organized by the following emissions sectors: transportation (70 percent of total emissions), residential buildings (15 percent), commercial and industrial buildings (11 percent), solid waste (3 percent), wastewater (0.6 percent), and municipal operations (0.4 percent).

The City's 2012 GHG emissions Inventory has seven emission sectors:

1. On-Road Transportation;
2. Electricity;
3. Natural Gas;
4. Solid Waste;
5. Water;
6. Off-Road Transportation; and
7. Wastewater.

The 2012 emissions inventory performed for the 2018 CAP evaluated emissions from the following sectors as summarized in Figure 2-1 and discussed below:

- **On-road transportation:** Emissions associated with passenger cars; light-, medium-, and heavy-duty trucks; buses; mobile homes; and motorcycles.
- **Electricity:** Emissions from building energy use associated with electricity in residential, commercial, and industrial buildings.
- **Natural gas:** Emissions from building energy use associated with combustion of natural gas in residential, commercial, and industrial buildings.
- **Solid waste:** Emissions from the disposal of organic materials in landfills and community-generated mixed waste from residences and business in the City.
- **Water:** Emissions associated with the energy consumed during treatment, transport, and distribution of water.
- **Off-road transportation:** Emissions from air and water vessels, heavy-duty construction equipment (e.g., excavators, cranes, dozers), landscaping equipment, and other off-road equipment.
- **Wastewater:** Fugitive emissions resulting from the treatment process for domestic sewage.

Further details regarding sources and methodology for the 2012 inventory can be found in Appendix A.

Notably, residents, businesses, and organizations make daily choices that result in GHG emissions and may be beyond the influence of the City or the 2018 CAP; however, individual residents or businesses should not feel limited to only the identified strategies, which are focused on the City’s inventoried emissions. As such, community members are encouraged to engage in climate-friendly actions such as purchasing locally-sourced foods and products to reduce transportation emissions or install efficient or clean-energy appliances and infrastructure to lower energy-related emissions. The City’s contribution to global climate change can be reduced through efforts at the individual level beyond what is described in the 2018 CAP.

2.2.1 City of Encinitas 2012 Greenhouse Gas Emissions

The 2012 GHG emissions inventory accounts for six primary GHGs: CO₂, CH₄, N₂O, sulfur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs); however, each GHG has varying levels of potency in the atmosphere. To simplify discussion and comparison of these emissions collectively, CAPs use a measurement referred to as carbon dioxide equivalent (CO₂e).

CO₂e translates each GHG to an equivalent volume of CO₂ by weighting it by its relative global warming potential (GWP). For example, per IPCC’s Fourth Assessment Report, CH₄ and N₂O are 25 and 298 times more potent, respectively, than CO₂ in their ability to trap heat in the atmosphere (IPCC 2007). Converting these gases into CO₂e allows consideration of all the gases in comparable terms to make it easier to communicate how various sources and types of GHG emissions contribute to climate change. A metric ton of CO₂e (MTCO₂e) is the standard measurement of GHG emissions.

In 2012, community and municipal activities in the City generated 483,773 MTCO₂e. The sector with the greatest contribution to global climate change was on-road transportation accounting for 54 percent of the City’s total GHG emissions or 260,127 MTCO₂e. The electricity and natural gas sectors contributed 23 and 13 percent of the City’s overall emissions, or 113,556 and 62,027 MTCO₂e, respectively.

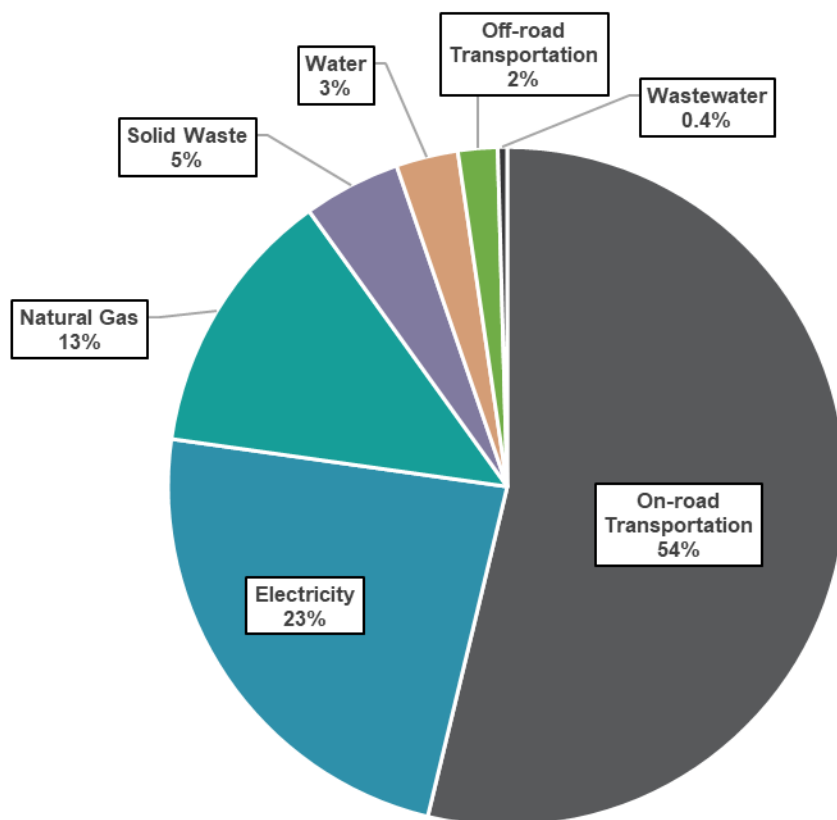
To put these emissions into perspective, 483,773 MTCO₂e is equivalent to combusting 54 million gallons of gasoline, combusting 258,000 tons of coal, or a year’s worth of carbon sequestration from 458,000 acres of U.S. forests (U.S. Environmental Protection Agency [EPA] 2017).

Breakdown of Emitting Sectors in 2012:

1. On-Road Transportation (54%)
2. Electricity (23%)
3. Natural Gas (13%)
4. Solid Waste (5%)
5. Water (3%)
6. Off-Road Transportation (2%)
7. Wastewater (0.4%)

Note: Values may not add to totals due to rounding

The City’s 2012 emissions are equal to combusting 54 million gallons of gasoline, combusting 258,000 tons of coal, and losing the carbon sequestration potential from 457,000 acres of forest.



Energy Policy Initiatives Center, 2017

Figure 2-1: Greenhouse Gas Inventory for the City of Encinitas in 2012 by Emission Sector

Additional details related to the specific emission sectors, data sources, assumptions, and methods can be found in Appendix A. Figure 2-1 above and Table 2-1 below show the breakdown of the City's GHG emissions in 2012.

Emissions Sector	MTCO₂e	Percent (%)
On-Road Transportation	260,127	54
Electricity	113,556	23
Natural Gas	62,027	13
Solid Waste	22,471	5
Water	14,299	3
Off-Road Transportation	9,138	2
Wastewater	2,155	0.4
Total	483,773	100

Notes: Columns may not add to totals due to rounding.
MTCO₂e = metric tons of carbon dioxide equivalent
Source: EPIC 2017.

2.3 Emission Projections

GHG emissions projections provide an estimate for future levels based on a continuation of current trends in activity, while also accounting for known regulatory actions by federal and State agencies (i.e., “legislative” actions) that can reduce emissions in the future if implemented. Through GHG projections, communities gain insight into the scale of local reductions needed to achieve statewide GHG reduction targets, in addition to legislative actions.

The first step in preparing comprehensive GHG emissions projections is the development of a BAU scenario, which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions beyond what has already been adopted at the time of the baseline year (i.e., 2012). Namely, federal, State, and local policies, programs, and regulations designed to take effect in future benchmark years (e.g., 2020, 2030), and the GHG reductions that will occur with their implementation, are not considered. The BAU model also assumes the population, housing, employment, and transportation activity will grow over time, consistent with projections. Further, the BAU model does not account for GHG emission reductions that will occur through implementation of the 2018 CAP.

The business-as-usual (BAU) GHG emissions forecasts in the CAP assume a continued increase in population, housing units, employment, and vehicle activity. Projections are based on SANDAG’s Series 13 Regional Growth Forecast.

Using these parameters, BAU projections were developed for the years 2020, 2030, and 2050. GHG estimates were determined to be 474,712 MTCO₂e in 2020 or 2 percent lower than 2012 emissions, 483,150 MTCO₂e in 2030 or 0.1 percent higher than 2012 emissions, and 497,811 MTCO₂e in 2050 or 3 percent higher than 2012 emissions. Details regarding BAU assumptions and methodology can be found in Appendix A.

2.3.1 Demographic Trends

GHG emission projections were estimated for 2020, 2030, and 2050 using City-specific demographic and vehicle projections from the San Diego Association of Governments’ (SANDAG’s) Series 13 Regional Growth Forecast. The City is expected to experience modest population growth by 2020, 2030, and 2050, as reflected in the emissions projections. Based on data used by the Energy Policy Initiatives Center (EPIC) to estimate projections, the City’s population is expected to increase by 6 percent in 2020, 7 percent in 2030, and 10 percent in 2050 as compared to 2012 population levels. Total jobs are expected to increase by 4 percent by 2020, 6 percent by 2030, and 12 percent by 2050 as compared to 2012 job levels. Further details on the underlying SANDAG data used for emissions projections can be found in Appendix A.

The City’s population is expected to increase by 6% in 2020, 7% in 2030, and 10% in 2050.

The milestone years of 2020, 2030, and 2050 were selected for BAU projections to provide a comprehensive picture of the City’s short-term and long-term emissions levels without considering reductions realized through federal and State regulations. Further, 2020, 2030, and 2050 represent benchmark years in terms of achieving reductions goals (i.e., 1990 levels of GHGs by 2020 as mandated by Assembly Bill [AB] 32, 40 percent below 1990 levels of GHGs by 2030 as mandated by Senate Bill [SB] 32, and 80 percent below 1990 levels as directed by Executive Order [EO] S-3-05). As such, certain legislative-related reductions will be anticipated to occur by 2020, 2030, and 2050. Projecting a BAU scenario for these years serves as the basis for the remainder of the climate action planning process.

2.3.2 Legislative Reductions

The second step in the climate action planning process is to model future emissions for benchmark years (i.e., 2020 and 2030) including a variety of legislative actions targeting future GHG reductions without any additional local governmental action contained in the 2018 CAP. The applied legislative reductions include:

- California Renewables Portfolio Standards
- California Solar Policies and Programs
- California Energy Efficiency Standards
- Federal and California Vehicle Efficiency Standards

A detailed description and analysis of how specific legislative reductions are included in the City's BAU GHG emissions inventory and projections can be found in Appendix A and B. Table 2-2 below shows the summary of the City's projected BAU GHG emissions with and without legislative action for the years 2020 and 2030. A BAU scenario including emissions reductions from legislative action was not modeled for 2050 because of the inherent uncertainty regarding political climate, advances in technology and climate science, and efficacy of existing or planned programs.

Table 2-2 City of Encinitas Emissions Business-as-Usual and Legislative-Adjusted Projections (MTCO₂e/year)

Emissions Sector	2012	2020		2030	
		BAU Projection	Legislative-Adjusted Projection	BAU Projection	Legislative-Adjusted Projection
On-Road Transportation	260,127	229,059	213,334	221,787	165,001
Energy ¹	175,583	194,621	157,114	206,743	119,587
Solid Waste ²	22,471	24,575	24,575	25,014	25,014
Water	14,299	15,055	15,055	15,541	15,541
Off-Road Transportation	9,138	8,943	8,943	11,441	11,441
Wastewater	2,155	2,460	2,460	2,625	2,625
Total	483,773	474,712	419,873	483,150	339,209
Percent change from 2012 (%)	-	-2%	-13%	0.1%	-30%

Notes: Columns may not add to totals due to rounding. BAU = business as usual, GHG = greenhouse gas emissions, MTCO₂e = metric tons of carbon dioxide equivalent, CAP=climate action plan.

¹ Emissions from energy are combined emissions from electricity usage and natural gas combustion.

² The solid waste sector includes emissions from solid waste disposal in landfills and waste-in-place emissions from the closed Encinitas Landfill.

Source: EPIC 2017.

2.3.3 Business-as-Usual Greenhouse Gas Emissions Projections with Legislative Reductions

Implementation of the legislative actions listed above will contribute to reductions in GHG emissions in the City, as shown in Table 2-2. By 2020, emissions are projected to decline by approximately 13 percent below 2012 levels; by 2030, emissions are projected to decrease by approximately 30 percent as compared to 2012 levels. The overall decrease in emissions is because of federal and State policies existing in the baseline year of 2012.

2.4 Reductions Targets

The 2018 CAP aims to reduce GHG emissions by 13 percent below 2012 levels by 2020 and 41 percent by 2030. As directed by AB 32, SB 32, and Executive Orders S-3-05 and B-30-15, the State targets a reduction in statewide GHG emissions of:

- 1990 levels by 2020;
- 40 percent below 1990 levels by 2030; and
- 80 percent below 1990 levels by 2050.

AB 32, SB 32, and EO B-30-15 use 1990 levels as a benchmark to identify statewide reduction targets. Because the City's 1990 emissions level was not estimated, proportional targets for the City's CAP were developed from the 2012 baseline that are consistent with direction from the 2008 Scoping Plan.

The California Air Resources Board (CARB) released the *2017 Climate Change Scoping Plan Update* (proposed 2017 Scoping Plan Update) pursuant to AB 32 and SB 32. The proposed 2017 Scoping Plan Update concluded that the State's emissions goal of 80 percent below 1990 by 2050 will be consistent with the IPCC's analysis specifying the global emissions trajectory needed to stabilize atmospheric concentration (i.e., levels of 450 ppm of CO₂ or less is needed to reduce the likelihood of catastrophic global climate change) (CARB 2017).

Taking into consideration CARB's recommendation in the 2008 Scoping Plan, the 2011 CAP developed a 12 percent reduction target from 2005 baseline levels (546,548 MTCO₂e) by 2020 (646,947 MTCO₂e under the BAU scenario). The 2017 Scoping Plan Update recommends local targets of 6 MTCO₂e per capita by 2030 and 2 MTCO₂e in 2050. In addition, the statewide 2020 target is to reduce 2020 emissions to 1990 levels. Estimating the equivalent reduction needed from the 2012 baseline based on the State inventory, the City would need to reduce emissions 4 percent below 2012 levels by 2020 to be consistent with AB 32. Recognizing that anticipated State, federal, and local actions would achieve significant reductions by 2020, the City elected to set a more ambitious target for 2020. In summary, the City will aim to achieve the following reduction targets:

Taking legislative reductions into account, emissions are projected to decrease in the BAU forecast in 2020 to meet the State goals. Legislative actions are expected to reduce the BAU forecast in 2030; however, reductions in emissions in 2020 and 2030 are not, in and of themselves, enough to meet established targets.

- 13 percent below 2012 levels by 2020; and
- 41 percent below 2012 levels by 2030.

To reach the short-term reduction goal of 13 percent below 2012 GHG emissions levels, the City will need to reduce emissions by 53,232 MTCO₂e to 421,481 MTCO₂e by 2020.

California's GHG reduction targets have been legislatively adopted for 2020 and 2030, while the 2050 goal is expressed in an executive order. In addition, CARB's 2017 Scoping Plan Update focuses on meeting the 2030 reduction target, as directed in SB 32. Therefore, the 2018 CAP aligns with the State in proposing actions and supporting measures to meet the 2030 target. As climate change science and policy continues to advance, the City will be able to apply new reductions toward meeting a long-term 2050 GHG emissions reduction goal in future CAP updates, as outlined in Chapter 4. Over the coming decades new innovations and technologies will likely become available that will enable further GHG reductions. New methods may become available to quantify measures that are currently unquantifiable. Finally, new State and federal regulations may further reduce emissions in sectors currently addressed primarily by local actions and supporting measures.

To achieve the long-term GHG reductions, the City will need to reduce emissions by 197,724 MTCO₂e to 285,426 MTCO₂e (41 percent below 2012 levels) by 2030. The City achieves the 2020 target because of federal and State legislative measures; however, such GHG-reducing legislation alone is not sufficient to achieve the 2030 target. As described in Chapter 3, to meet the City's 2030 target, the City will need to implement local GHG reduction strategies. A detailed technical analysis of the City's emissions reduction targets and goals can be found in Appendix B. Figure 2-2 shows the City's BAU emissions and legislative-adjusted BAU forecasts alongside the City's GHG reduction targets over time, discounting any strategies or actions proposed in the Chapter 3.

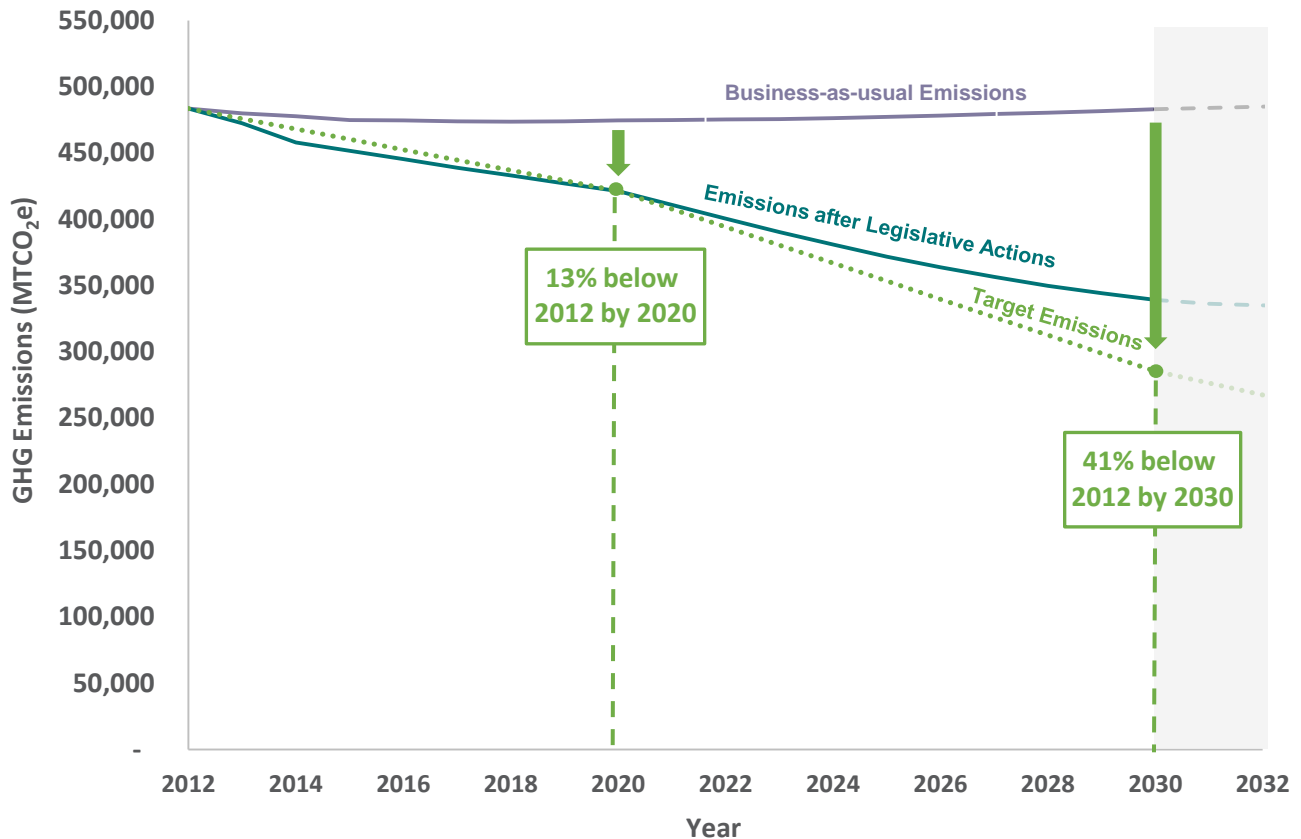


Figure 2-2: BAU and Legislative-Adjusted Forecasts and Targets without CAP Actions



CHAPTER 3

Greenhouse Gas Reduction Strategies, Goals, and Actions

This chapter outlines the strategies, goals, and specific actions that the City of Encinitas (City) will implement to achieve its greenhouse gas (GHG) reduction targets, as outlined in Chapter 2. Strategies, goals, and actions focus on locally-based programs, policies, and projects that will reduce GHG emissions in various categories as a complement to legislative actions taken by the federal and State governments.

Strategies, which represent the primary ways to achieve GHG reductions, are organized under six GHG emissions categories. Within each strategy are a series of goals, actions, and supporting measures that define the objectives, programs, policies, and projects the City will implement to reduce GHG emissions. These actions and measures mainly focus on community-scale reductions, but also include local government operations. Through partnerships with and among residents, businesses, agencies, and other organizations, these actions and measures will provide net benefits for everyone.

Emissions categories include:

- Electricity & Natural Gas
- Water
- On-Road Transportation
- Off-Road Transportation
- Solid Waste
- Carbon Sequestration

The 2018 Climate Action Plan (2018 CAP) accounts for existing plans, programs, and activities that the City has already undertaken to reduce emissions by acknowledging these efforts and, in some cases, building or expanding upon them. The 2011 CAP included 34 GHG reduction measures from the transportation, energy, solid waste, and water sectors designed to reduce emissions through the incorporation of renewable energy; increased energy, fuel, and water efficiency; parking maximums; zero-emission vehicle infrastructure; and more. The 2018 CAP encompasses and expands upon the goals of the 2011 CAP reduction measures by including measurable and quantifiable goals. The 2018 CAP has been prepared to be consistent with Section 15183.5 of the CEQA Guidelines. For more details on how proposed strategies and actions differ from the 2011 CAP, see Appendix C.

Many of the strategies and actions to reduce GHG emissions will also have important co-benefits, which are discussed in this chapter. Co-benefits are the additional beneficial effects that will result from implementation of strategies and actions. Climate change adaptation and building community resilience are important components of climate action planning, and this is discussed in further detail in Chapter 5.

Climate action planning is important because if community emissions in the City were to continue to grow under business-as-usual (BAU) practices and activities, the City's GHG emissions would meet and exceed the 2020 reduction target by approximately 50,000 metric tons of carbon dioxide equivalent (MTCO₂e), but would fall short of the 2030 target by 53,783 MTCO₂e. As described in Chapter 2, the City has established a 2020 GHG emissions reduction target (13 percent below 2012 levels) and a 2030 target (41 percent below 2012 levels) to reduce annual emissions levels. With the strategies proposed in the 2018 CAP, the City's GHG emissions will exceed 2020 and 2030 targets by 9,532 and 69,159 MTCO₂e per year, respectively.

Under a business-as-usual (BAU) scenario, the City would meet its 2020 target, but would fall short of meeting the 2030 target by 53,783 MTCO₂e.

Table 3-1 below shows the GHG reductions attributable to the strategies included in the 2018 CAP. Table 3-2 demonstrates how the anticipated reductions will help the City meet its GHG reduction targets. Detailed calculations and description of the calculation methodologies are provided in Appendix B.

Table 3-1 GHG Reductions from Proposed Reduction Strategies for 2020 and 2030 (MTCO₂e)

Strategy	2020	2030
Building Efficiency	941	4,355
Renewable Energy	434	45,456
Clean and Efficient Transportation	4,481	6,526
Water Efficiency	712	735
Zero Waste	2,830	11,921
Reduce Off-Road Equipment	128	142
Carbon Sequestration	5	23
Federal and State Regulations	53,232	143,941
Total Reductions	62,764	213,100

Notes: Columns may not add to totals due to rounding.

MTCO₂e = Metric Tons of Carbon Dioxide Equivalent

Source: EPIC 2017.

Table 3-2 Effect of Plan Actions on City of Encinitas Emissions and Target (MTCO₂e)

Emissions	2020	2030
BAU Emission Projection	474,712	483,150
Legislative Reductions	53,232	143,941
Legislative-Adjusted BAU Emissions Projection (BAU Projection – Legislative Reductions)	421,480	339,209
Baseline Emissions (2012)	483,773	483,773
City of Encinitas GHG Reduction Target (Percent below 2012)	13%	41%
Target Emissions	421,481	285,426
Reductions from 2018 CAP Actions	9,532	69,159
City of Encinitas Emissions with 2018 CAP (Legislative-Adjusted BAU – 2018 CAP Reductions)	411,949	270,050
Target Achieved?	YES	YES

Notes: Columns may not add to totals due to rounding.

MTCO₂e = Metric Tons of Carbon Dioxide Equivalent

Source: EPIC 2017.

3.1 GHG Reduction Strategy Framework

The 2018 CAP actions were developed using a GHG reduction strategy framework that was based on a combination of factors. These include:

- The feasibility of the action to be implemented by the City.
- The need for greater reductions in categories with the most emissions (i.e., electricity and on-road transportation).
- Existing programs, policies, or projects that can be expanded or proposed policies yet to be adopted.
- Feedback from the community and other stakeholders (e.g., Environmental Commission and public workshops).
- Technological innovations.



The reduction strategy framework consists of emissions categories, strategies, goals, actions, and supporting measures, which are defined below:

Emissions Category

Source of GHG emissions, as defined by the City's baseline assessment. Emissions categories include: Electricity & Natural Gas, Water, On-Road Transportation, Off-Road Transportation, Solid Waste, and Carbon Sequestration. Emissions categories, except for Carbon Sequestration, align with the GHG Emissions inventory outlined in Chapter 2. Carbon Sequestration is additionally included in this reduction strategy framework as a category by which to reduce overall emissions.

Strategy

High-level plans the City will implement to achieve GHG reductions in a specific emissions category. Each emissions category may have one or more associated strategies. The framework includes 7 overall strategies.

Goal

The general objective that the City will strive to achieve to address the defined strategy. Each strategy will have at least one or more goals.

Target Year

Year corresponding to the emissions targets set by the City and that are in line with State laws and guidelines. For the 2018 CAP, the City's proposed target years include 2020 and 2030.

Performance Metric

Quantitative metric by which achievement of the specified goal will be measured. Each goal will have two performance metrics, one for each target year (i.e., 2020 and 2030).

GHG Reduction Potential	Estimated reduction in local greenhouse gas emissions if the performance metric is met. The reduction is presented in MTCO ₂ e.
City Actions (Actions)	Programs, policies, or projects the City will implement that will cause a <i>direct</i> and <i>measurable</i> reduction in greenhouse gas emissions.
Supporting Measures	Programs, policies, or projects the City will implement that could not be quantified, but will have an indirect effect on greenhouse gas emissions reductions.

To help meet designated targets, the 2018 CAP proposes 19 actions and numerous supporting measures organized under 7 strategies and 6 emissions categories. The following sub-sections detail GHG reduction strategies under each emissions category. A description of the emissions category is followed by separate tables describing each strategy, its goal(s), performance metrics, GHG reduction potential, and any supporting measures. While many of the emission reductions of the city actions can be quantified, others are difficult to quantify and are thus classified as supporting measures. Supporting measures cannot be quantifiable because of data limitation or lack of an available method to quantify emissions reductions; however, the combination of all actions and measures contribute towards achieving 2020 and 2030 targets and are important to include.

Additional detail and calculations can be found in Appendix B. Chapter 4 further describes how City actions will be implemented.

3.1.1 Electricity and Natural Gas

Electricity and natural gas consumption accounted for 36 percent of the City's total emissions in 2012. Legislative reductions from State actions will reduce electricity and natural gas emissions by 45 percent. Emissions reductions from the Electricity and Natural Gas Category are divided into two strategies: Building Efficiency and Renewable Energy. The success of these strategies relies on coordination with local utilities and organizations, participation from the community, and administration of new or revised local policies and programs. All Electricity and Natural Gas strategies also serve as adaptation strategies by reducing overall energy demand and increasing the ability of the community and local economy to weather future change.



Strategy 1: Building Efficiency

The energy (electricity and natural gas) used in buildings accounts for the majority of GHG emissions in the Electricity and Natural Gas category. Although legislative reductions related to State actions will help reduce emissions associated with building energy, additional reductions can help to increase building efficiency in the City. Under this strategy emissions are reduced by requiring residential and commercial units to be more energy efficient, and by improving energy efficiency beyond State requirements. Implementation of the Building Efficiency Strategy would reduce the City's emissions by 941 MTCO₂e by 2020 and 4,355 MTCO₂e by 2030. Table 3-3 outlines the framework for this strategy.

Co-Benefits of Building Efficiency:

- Improved Air Quality
- Reduced Fossil Fuel Reliance
- Energy Savings
- Cost Savings
- Increased Renewable Energy

Table 3-3 Strategy 1: Building Efficiency

Goal 1.1: Reduce Building Energy Consumption

City Action: BE-1 Require Energy Audits of Existing Residential Units

Starting in 2018, require all existing residential units that seek building permits for modifications, alterations, and additions to perform energy audits.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce energy use by 15% in residential units that complete energy efficiency audits and implement energy retrofits. 80 units implement energy retrofits (reduce 85,000 kWh and 4,500 therms)	47
2030	Reduce energy use by 15% in residential units that complete energy efficiency audits and implement energy retrofits. 330 units implement energy retrofits (reduce 380,000 kWh and 20,000 therms)	122

City Action: BE-2 Require New Single-Family Homes to Install Solar Water Heaters

Starting in 2018, require all new single-family homes to install solar water heaters or other efficiency technology, unless the installation is impracticable due to poor solar resources. Other efficiency technology would include installation of a renewable energy technology system that uses renewable energy as the primary energy source for water heating.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	130 solar water heaters installed on new single-family homes (reduce 150,000 kWh and 17,000 therms)	130
2030	410 solar water heaters installed on new single-family homes (reduce 470,000 kWh and 230,000 therms)	1,241

City Action: BE-3 Adopt Higher Energy Efficiency Standards for Commercial Buildings

Starting in 2018, require 1) all new commercial buildings, including commercial portion of mixed-use projects, and 2) commercial building modifications, alterations, and additions that require building permits with an area larger than 10,000 square feet to meet the 2016 California Green Building Standards Code Nonresidential Tier 1 Voluntary Measures.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce energy use in new commercial spaces by 6% (reduce 232,000 kWh and 7,200 therm)	98
2030	Reduce energy use in new commercial spaces by 6% (reduce 1.1 million kWh and 34,000 therm)	220

City Action: BE-4 Require Commercial Buildings to Install Solar Water Heaters

Starting in 2018, require 1) all new commercial buildings, including the commercial portion of mixed-use projects, 2) commercial building modifications, alterations, and additions that require building permits with an area larger than 10,000 sq. ft, to install solar water heaters or other efficiency technology, unless the installation is impracticable due to poor solar resources. Other efficiency technology would include installation of a renewable energy technology system that uses renewable energy as the primary energy source for water heating.

Table 3-3 Strategy 1: Building Efficiency

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce energy use in commercial spaces (reduce 12,000 kWh and 112,000 therm)	612
2030	Reduce energy use in commercial spaces (reduce 54,000 kWh and 500,000 therm)	2,728

Supporting Measures for Goal 1.1:

- Facilitate homeowner and business owner financing of energy efficiency measures by expanding PACE financing options.
- Expand and implement a Green Building Incentive Program to promote energy retrofits at homes and businesses.
- Educate homeowners about the energy audit process and any applicable incentives and streamline the process of identifying energy auditing contractors.
- Educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.
- Promote pool pump conversions to variable speed pumps.
- Continue energy efficiency permit fee waiver program.

Goal 1.2: Reduce Municipal Operation Energy Consumption**City Action: MBE-1 Continue Implementation of Energy Efficient Projects in Municipal Facilities**

Reduce municipal energy use below 2012 baseline energy use. Municipal facilities include the Civic Center, libraries, Community Center, fire stations, parking lots and more.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce energy use (electricity and natural gas) by 7.5% in municipal facilities (not including street lights)	54
2030	Reduce energy use (electricity and natural gas) by 15% in municipal facilities (not including street lights)	44

Supporting Measures for Goal 1.2:

- Conduct audits to quantify energy use and to identify and quantify energy efficiency and conservations opportunities.
- Identify grants, rebate and incentive programs, and financing opportunities for municipal energy efficiency programs.
- Adopt a policy that new municipal buildings will be ZNE buildings.
- Convert City streetlights, traffic signals, and outdoor lighting to LED or other efficient lighting technology and monitor with energy management system.
- Implement the Environmentally Preferable Purchase Policy.
- Continue to track State legislation and lobby for change were proposals align with City goals and vision.

Notes:

CSE = Center for Sustainable Energy; kWh = kilowatt-hour; LED = low-emitting diode; MTCO₂e = metric tons of carbon dioxide equivalent; SDG&E = San Diego Gas & Electric; PACE = Property Assessed Clean Energy; ZNE = zero net energy

Source: EPIC 2017.

Strategy 2: Renewable Energy

Transition from fossil fuels to renewable energy for electricity generation will reduce emissions and provide a more sustainable source of electricity. Under this strategy, emissions are reduced by streamlining access to renewable energy; increasing the supply of renewable energy for residences, commercial, and municipal operations within the City; and increasing the amount of onsite renewable energy at existing and new residential and non-residential development. Implementation of Strategy 2 would reduce the City's emissions by 434 MTCO₂e by 2020 and 45,456 MTCO₂e by 2030. Table 3-4 outlines the framework for this strategy.

Co-Benefits of Renewable Energy:

- Improved Air Quality
- Improved Public Health
- Green Jobs
- Reduced Fossil Fuel Reliance
- Energy Savings
- Cost Savings
- Increased Renewable Energy

Table 3-4 Strategy 2: Renewable Energy**Goal 2.1: Achieve 100% Renewable Electricity Supply in Homes and Businesses****City Action: RE-1 Establish a Community Choice Energy Program**

Present to City Council for consideration a Community Choice Energy program that increases renewable electricity supply.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Launch a CCE Program with renewable electricity sources as a percentage of overall energy supplies equal to or greater than the current percentage of renewable electricity provided by SDG&E ¹ and 80% customer participation.	-
2030	100% renewable electricity supply and 80% customer participation.	43,644

City Action: RE-2 Require New Homes to install Solar Photovoltaic Systems²

Starting in 2018, require

1) New single-family homes to install at least 1.5 W solar per square feet (e.g., 2,000 sq. ft. home = 3 kW) or minimum 2 kW per home; 2) New multi-family homes to install at least 1 W solar per square feet (e.g., 1,000 sq. ft. home = 1 kW) or minimum 1 kW per unit, to install solar PV systems, unless the installation is impracticable due to poor solar resources.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Install 400 kW (0.4 MW) of solar photovoltaics on new homes.	141
2030	Install 1,000 kW (1 MW) of solar photovoltaics on new homes.	614

City Action: RE-3 Require Commercial Buildings to install Solar Photovoltaic Systems¹

Starting in 2018, require installation of at least 2 W per sq. ft. of building area (e.g., 2,000 sq. ft. = 3 kW) on 1) all new commercial buildings, including the commercial portion of mixed-use projects, 2) commercial building modifications, alterations, and additions that require building permits with square footage larger than 10,000 sq. ft., unless the installation is impracticable due to poor solar resources.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Install 200 kW (0.2 MW) of solar photovoltaics new commercial spaces.	59
2030	Install 800 kW (0.8 MW) of solar photovoltaics on new commercial spaces.	452

Supporting Measures for Goal 2.1:

- Develop RFP and allocate funds for CCE Technical Feasibility Study.
- Expand and implement a Green Building Incentive Program to increase the installation of solar PV, solar water heating at homes and businesses.
- Facilitate homeowner and business owner financing of renewable energy systems by expanding PACE financing options.
- Educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.
- Consider the purchase of Renewable Energy Credits (RECs), if needed, to achieve to achieve 100% renewable electricity supply in 2030.

¹ The renewable electricity supply requirement would be compliant with the State's most current RPS target (at least 33% by December 31, 2020, 40% by December 31, 2024, 45% by December 31, 2027, and 50% by December 31, 2030 (SB 350, §399.15(b)(2)(B))) and would be equal to or exceed the year 2020 power mix of the existing utility provider SDG&E (which was 43% "Eligible Renewable" in 2016 and projected to be approximately 49% in 2021). Current Power Content Labels of utility providers showing the power mix is provided by the California Energy Commission, Utility Annual Power Content Labels (<http://www.energy.ca.gov/pcl/labels/>).

² In a mixed-use building that includes one type of use on top of another (e.g., residential above commercial), photovoltaic systems may be installed on the roof of the entire building to offset electricity usage from both land use types.

Goal 2.2: Increase Renewable Electricity Supply in Municipal Operations**City Action: MRE-1 Supply Municipal Facilities with Onsite Renewable Energy**

Supply municipal facilities with onsite renewable energy to achieve "Net Zero Electricity" municipal operations. Implement "City of Encinitas Solar Assessment Report" by installing 1.3 MW of solar systems at city facilities.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	50% of City facility electricity is supplied by onsite renewable energy generation (0.65 MW equivalent).	233
2030	100% of City facility electricity is supplied by onsite renewable energy generation (1.3 MW equivalent).	746

Supporting Measures for Goal 2.2:

- Conduct audits to quantify energy use and to identify and quantify energy efficiency and conservations opportunities.
- Identify grants, rebate and incentive programs, and financing opportunities for municipal energy efficiency and renewable energy programs.
- Implement the Environmentally Preferable Purchase Policy.

Notes:

CCE = Community Choice Energy; CSE = Center for Sustainable Energy; kWh = kilowatt; MTCO₂e = metric tons of carbon dioxide equivalent; MW = megawatt; RFP = Request for Proposal; SDG&E = San Diego Gas & Electric; PACE = Property Assessed Clean Energy; W = watt

Source: EPIC 2017.

3.1.2 Water

GHG emissions are produced through the energy used to pump, transport, and treat water and wastewater. Although water and wastewater-related GHG emissions only accounted for three percent of the City's emissions in 2012, water conservation is needed to address serious periodic drought issues that frequently affect the City and the State. As discussed in Chapter 5, drought conditions could increase in frequency and severity because of climate change over the long-term. All water strategies also serve as adaptation strategies by preserving water quality and encouraging water conservation.



Strategy 3: Water Efficiency

Water and wastewater-related actions and supporting measures under this strategy will reduce both the strain on water supplies and GHG emissions from pumping and treatment activities. Under Proposition 218, local jurisdictions must follow cost of service principles when setting water rates. As a result, the San Dieguito Water District (SDWD) can only charge customers what it costs SDWD to serve them with water. For this reason, water rates cannot be directly used to encourage water conservation. However, to account for the increased costs associated with supplying and producing water, water rates can be tiered, to make higher levels of water use more expensive. City Action WE-1 takes into consideration the indirect effects increased water rates could have on water consumption. With increased water rates, water consumption, and thus GHG emissions, will likely decrease. Furthermore, the supporting measures proposed will reduce emissions primarily through water conservation in new and existing facilities, providing incentives to reduce indoor and outdoor water consumption, and providing education and outreach on water efficiency. Emissions reductions from Water Efficiency Strategy rely on successful coordination with

Co-Benefits of Water Efficiency:

- Water Supply and Conservation
- Improved Public Health
- Energy Savings
- Cost Savings
- Increased Resiliency

and participation from SDWD, City residents, and businesses. Implementation of Strategy 3 would reduce the City’s emissions by 712 and 735 MTCO₂e by 2020 and 2030, respectively. Table 3-5 outlines the framework for this strategy.

Table 3-5 Strategy 3: Water Efficiency		
Goal 3.1: Reduce City-wide Potable Water Consumption		
City Action: WE-1 Regularly Conduct Water Rate Studies and Implement Approved Water Rates		
SDWD and OMWD Board of Directors' approved water rate increase from 2012 to 2017.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Save 5 GPCD water use (258 million gallon water saving).	712
2030	Save 5 GPCD of water use (266 million gallon water saving).	735

- Supporting Measures for Goal 3.1:**
- Facilitate homeowner and business owner financing of water efficiency measures by expanding PACE financing options.
 - Educate homeowners and businesses about water efficiency rebate and incentive programs offered to SDWD and OMWD customers.
 - Evaluate key challenges that were identified in the 2016 SDWD Potable Reuse Feasibility Study.
 - Conduct audits and retrofit all municipal facilities with water-efficient features to reduce potable water use at municipal facilities.
 - Convert all current municipal landscape adjacent to recycled water pipelines to recycled water. Look for opportunities to work with the San Elijo Joint Powers Authority to extend recycled water pipelines to additional municipal facilities, when economically viable.
 - Evaluate reducing the landscape area thresholds for projects to meet regulations outlined in the City's existing Water Efficient Landscape Ordinance (EMC Chapter 23.26). This ordinance promotes water conservation by requiring new and redeveloped landscapes to use water efficient plants and technology.
 - Implement and enforce the Water Supply Shortage Response Program ordinances (administered by SDWD and OMWD) which require citywide water conservation during drought conditions.
 - The City's Clean Water Program will continue to be actively involved in the Carlsbad Watershed Water Quality Improvement Plan development and implementation.
 - Implement a Low Impact Development Outreach and Incentive Program for residents and businesses.
 - Work with developers to implement Low Impact Development and other stormwater features on new and redevelopment projects.
 - Source water from least-cost sources first, whenever possible.

Notes:
GPCD = gallons per person per day; SDWD = San Dieguito Water District; MTCO₂e = metric tons of carbon dioxide equivalent; OMWD = Olivenhain Municipal Water District; PACE = Property Assessed Clean Energy
Source: EPIC 2017.

3.1.3 On-Road Transportation

Internal combustion from on-road transportation is the largest contributor to the City’s GHG emissions. Emissions from on-road transportation sources accounted for 54 percent of the City’s total emissions in 2012. Legislative reductions, mainly from improvements in State and federal vehicle fuel efficiency standards, will contribute to reducing transportation emissions. While these legislative reductions apply to the fuel efficiency of vehicle operations, strategies that affect the frequency or distance of vehicle travel are within local or regional control and can be addressed in a local CAP.



Strategy 4: Clean and Efficient Transportation

Under this strategy, emissions are reduced by reducing vehicle trips through consolidation of vehicle trips and non-motorized solutions, encouraging the use of electric and alternative fuel vehicles, and reducing vehicles miles traveled (VMT) through smarter land use planning. Emissions reductions from this strategy rely on coordination with, and participation from local and regional transportation and planning agencies, residents, and businesses. Implementation of the Clean and Efficient Strategy would reduce the City's emissions by 4,481 and 6,526 MTCO_{2e} by 2020 and 2030, respectively. Table 3-6 outlines the framework for this strategy.

Co-Benefits of Clean and Efficient Transportation:

- Improved Air Quality
- Reduced Fossil Fuel Reliance
- Improved Public Health
- Improved Mobility
- Cost Savings

Table 3-6 Strategy 4: Clean and Efficient Transportation

Goal 4.1: Reduce Vehicle Miles Traveled		
City Action: CET-1 Complete and Implement the Citywide Active Transportation Plan		
The Citywide Active Transportation Plan is under development, therefore, the emissions reduction is currently not quantifiable. The Active Transportation Plan will integrate the existing transportation and mobility plans including Bike Master Plan and Pedestrian Master Plan.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Non-Quantified ³	-
2030	Non-Quantified ³	-
City Action: CET-2 Implement a Local Shuttle System		
Implement service routes recommended in Encinitas Transit Feasibility Study, using CNG buses for these routes:		
<ul style="list-style-type: none"> • By 2020: Express Services to educational facilities - one route to Mira Costa College and one route to La Costa Canyon High School. • By 2025: One route to Encinitas Circulator and one to Encinitas COASTER connection. 		
Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Reduce 365,000 VMT.	130
2030	Reduce 875,000 VMT.	172
Supporting Measures for Goal 4.1:		
<ul style="list-style-type: none"> • Develop and implement a complete streets policy. • Develop program to support car sharing and bike sharing for the community.⁴ • Complete Safe Routes to Schools projects to decrease need to drive students to school. • Coordinate with regional transit authorities and local school districts to improve student busing and public transit options. • Support SANDAG iCommute Program for guaranteed ride home for the community. 		

³ Commuter mode share targets will be included in the CAP once the Active Transportation Plan (ATP) and the ATP Implementation Plan are complete. These plans will form the basis for the commuter mode share shift targets and are necessary to be completed in order to calculate numeric mode shift targets. The ATP is expected to identify a variety of strategies and specific projects that the City will implement to encourage and enhance mobility throughout the City. Many mobility projects will be part of the plan, including several railroad crossings connecting residential areas with commercial centers and recreational areas, bike lanes, bike paths, bike boulevards, new and improved sidewalks, and many traffic calming improvements. Other components of the CAP will also support commuter mode share shift, including the implementation of a local shuttle system (CET-2), development of a regional bikeshare program, and others. It is anticipated that implementation of the ATP will produce a significant shift from primarily single-occupancy vehicle commuting to carpooling, transit ridership, biking and walking. The ATP and associated Implementation Plan are expected to be complete in 1-2 years. Upon completion of these plans, the City will update the CAP (prior to the routine 5-year update) to incorporate numeric commuter mode share shift targets and associated emissions reduction targets.

⁴ A regional Bikeshare program for the North County coastal area is currently in the works and a pilot program may be in operation as soon as April 2018. The Bikeshare program is expected to increase the number of trips taken by bike and reduce car trips. The program will have the capability to track increased ridership through an on-bike GPS, in-app tracking and data collection system.

Table 3-6 Strategy 4: Clean and Efficient Transportation

- Develop and implement a City Bike Rack Program.
- Develop and implement a program to incentivize City employees commuting to work by bike or other modes of alternative transport as a model for other local employers.
- Adopt the National Association of City Transportation Officials *Urban Bikeway Design Guide* and utilize as a policy in the Capital Improvement Program (CIP) roadway projects.
- Update the City's Housing Element⁵ and implement and enforce the City's existing specific plans (Downtown Encinitas Specific Plan and the North 101 Corridor Specific Plan) to reduce Vehicle Miles Traveled and encourage dense, infill development.

Goal 4.2: Reduce On-road Fuel Use**City Action: CET-3 Improve Traffic Flow**

Improve traffic flow by retiming traffic signals and installing roundabout at intersections in the City.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Retime 60 traffic signals and install 3 roundabouts.	3,671
2030	Install 4 roundabouts.	2,839

Supporting Measures for Goal 4.2:

- Identify rebate and incentive programs and financing opportunities for installing roundabouts.
- Update the City's Circulation Element to support improved traffic flow.

Goal 4.3: Increase Use of Alternative Fuels**City Action: CET-4 Require Residential Electric Vehicle Charging Stations**

Starting in 2018, require new residential units to install EVCS equipment. For 1) Single Family: Install complete 40-Amp electrical circuit (EV Ready) 2) Multi-Family: Install EVCS equipment at 5% of the total number of parking spaces.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Install 65 electric vehicle charging stations.	185
2030	Install 370 electric vehicle charging stations.	1,357

City Action: CET-5 Require Commercial Electric Vehicle Charging Stations

Starting in 2018, require installation of EVCS at 8% of the total number of parking spaces. For 1) all new commercial buildings, including the commercial portion of mixed-use projects, 2) commercial building modifications, alterations, and additions that require building permits with square footage larger than 10,000 sq. ft.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Install 150 electric vehicle charging stations.	440
2030	Install 490 electric vehicle charging stations.	1,789

Supporting Measures for Goal 4.3:

- Expand and implement a Green Building Incentive Program to increase electric vehicle charging at home and businesses.
- Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community.
- Work with SDG&E to explore projects through their Power Your Drive Program.
- Develop and implement EV charging plan for municipal facilities.
- Pursue partnerships with school districts and NCTD to explore the use of electric busing or public transit busing for schools.

⁵ The City is currently in the process of updating its Housing Element to be compliant with state law. The updated Housing Element will promote higher density, infill development for low income housing throughout City at specific locations. The Housing Element will aim to add at least 1,286 new affordable housing units. Infill development sites have been targeted as potential locations for the increased housing, with preferences given to locations served by public transportation. Up-zoning to increase density will also be a component of the updated Housing Element. The Downtown Encinitas and North 101 Corridor Specific Plans also encourage denser development opportunities, including allowances for mixed use. These more densely developed areas can support greater usage of alternative transportation modes, including biking, walking and transit. The City's NCTD Coaster station is located within downtown Encinitas and one of the most popular cycling routes in the county is located along North Coast Highway 101.

Table 3-6 Strategy 4: Clean and Efficient Transportation

- Implement a wayfinding program with signage and information systems to facilitate walking, biking, and efficient driving and parking.
- Implement educational activities to raise awareness about EVs among residents and businesses.
- Develop and implement a program to incentivize City employees commuting to work by Electric Vehicle or other modes of alternative transport as a model for other local employers.

City Action: MCET-1 Transition to Zero Emission Vehicle (ZEV) Municipal Fleet

Develop a municipal fleet replacement plan to 1) convert gasoline-fueled cars and light-duty trucks to Zero Emission Vehicles, including all-electric vehicles or other ZEV technology by 2030. 2) convert to renewable diesel for all diesel-fueled heavy-duty trucks by 2020.⁶

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce City fleet fossil fuel use (gasoline and diesel) by 10%.	55
2030	Reduce City fleet fossil fuel use (diesel) by 30% and convert gasoline-fueled cars and light duty trucks to ZEV.	370 ⁷

Supporting Measures for Goal 4.3:

- Install EV charging stations at municipal facilities.
- Develop a City vehicle fleet conversion plan and identify funding to support conversion of fleet vehicles.

Notes:

CNG = Compressed Natural Gas; electric vehicle = E; EVCS = electric vehicle charging stations; MTCO₂e = metric tons of carbon dioxide equivalent; SDG&E = San Diego Gas & Electric; VMT = vehicle miles traveled

Source: EPIC 2017.

3.1.4 Off-Road Transportation

Off-road transportation accounted for 2 percent of the City's total emissions in 2012. Transitioning from fossil-fuel based to renewable or electric off-road equipment is a key strategy for reducing emissions.

Strategy 5: Reduce Off-Road Equipment

Under this strategy, emissions are reduced by eliminating the use of two-stroke engine leaf blowers, which are known to emit a number of air pollutants. Because a percentage of the fuel engine fails to undergo complete combustion, the engine produces GHG emissions. Emissions reductions from this strategy relies on coordination with the City's Environmental Commission as well as public outreach and education on alternatives to gas-powered leaf-blowing technologies. Implementation of Reduce Off-Road Equipment Strategy would reduce the City's emissions by 128 MTCO₂e by 2020 and 142 MTCO₂e by 2030. Table 3-7 outlines the framework for this strategy.

Co-Benefits of Off-Road Equipment Reduction:

- Improved Public Health
- Improved Air Quality

⁶ At the time that commuter mode share measures are calculated and included in the CAP, as described in CET-1, ZEV options for heavy duty fleet vehicles will also be evaluated and a revised target for heavy duty vehicles will be consider based on any advances in ZEV technology.

⁷ The 2030 performance metric and target for MCET-1 were revised subsequent to the preparation of the "Methods for Estimating Greenhouse Gas Emissions Reduction from Encinitas Climate Action Plan," dated September 2017 (Appendix B).

Table 3-7 Strategy 5: Reduce Off-Road Equipment		
Goal 5.1: Reduce Off-Road Fuel Use		
City Action: OR-1 Adopt a Leaf Blower Ordinance to Limit Use of 2-stroke Leaf Blowers		
Starting in 2018, prohibit 2-stroke leaf blowers and implement the phase-out of leaf blower emissions.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce all emissions from 2-stroke leaf blowers use.	128
2030	Reduce all emissions from 2-stroke leaf blowers use.	142
Supporting Measures for Goal 5.1:		
<ul style="list-style-type: none">Evaluate the use of alternative fueled landscaping equipment to reduce emissions.Educate home and business owners about alternatives to gas-powered leaf-blowing technologies.		
Notes: MTCO ₂ e = metric tons of carbon dioxide equivalent		
Source: EPIC 2017.		

3.1.5 Solid Waste

The solid waste category accounted for approximately 5 percent of the City’s total emissions in 2012. The Zero Waste Strategy aims to reduce emission through diverting solid waste from landfills. Solid waste disposal in a landfill generates emissions of GHGs through the anaerobic decomposition of organic products. To reduce these emissions, methane-generating organic material must be diverted away from landfills where they can properly decompose. Solid waste emissions reductions depend on expansion of County waste reduction, recycling, and composting programs; and participation from City residents and businesses to reduce waste and increase recycling.



Source: Solana Center for Environmental Innovation

Strategy 6: Zero Waste

Unlike the transportation, electricity, and natural gas categories, the City has greater jurisdiction over the handling of solid waste generated by the community. This strategy focuses on diverting a greater percentage of waste from landfills, through such method as composting and increased recycling. This strategy will also reduce waste in landfills, which will reduce costs to the City and reduce local odor impacts. Implementation of Strategy 6 would reduce the City’s emissions by 2,830 MTCO₂e by 2020 and 11,921 MTCO₂e by 2030. Table 3-8 outlines the framework for this strategy.

Co-Benefits of Zero Waste:

- Improved Air Quality
- Improved Water Quality
- Improved Public Health
- Cost Savings

Table 3-8 Strategy 6: Zero Waste

Goal 6.1: Divert Solid Waste		
City Action: ZW-1 Implement a Zero Waste Program		
Implement a Zero Waste Program to reduce waste disposal from residents and businesses in the community.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Divert 65% of total solid waste generated (equivalent to 5.3 pounds per capita per day waste disposal).	2,830
2030	Divert 80% of total solid waste generated (equivalent to 3 pounds per capita per day waste disposal).	11,921

Supporting Measures for Goal 6.1:

- Implement an Organic Waste Recycling Program through the following measures:
 - Support regional efforts to plan for and develop residential and commercial food scrap composting programs.
 - Facilitate the establishment of fully-permitted community appropriate compost facilities in the City.
 - Continue to support at-home management of food waste through educational workshops and subsidies of compost bins and worm bins.
 - Continue to support Zero Waste programs at local schools.
 - Provide free audits of restaurants and grocery stores to reduce waste generation.
 - Develop City Hall waste audits and consider pilot composting project based on audit results.
- Develop education program for textile recycling.
- Evaluate and expand existing recycling requirements at City permitted events and activities.
- Expand outreach and education on the City's C&D Ordinance that has a lower threshold for covered projects.
- Support product stewardship and extended producer responsibility initiatives.

Notes:C&D = Construction and Demolition; MTCO₂e = metric tons of carbon dioxide equivalent

Source: EPIC 2017.

3.1.6 Carbon Sequestration

Carbon sequestration refers to the process of removing atmospheric carbon dioxide (CO₂) through artificial or natural processes and occurs daily through the natural respiration of vegetation and trees. Carbon sequestration potential is lost when natural carbon sinks (e.g., trees) are cut down or removed. Conversely, a community can enhance or improve its carbon sequestration potential by increasing the volume and rate of planting trees and nurturing an urban canopy.

Co-Benefits of Carbon Sequestration:

- Improved Air Quality
- Improved Water Quality
- Improved Biological Resources

Strategy 7: Carbon Sequestration

As part of the natural carbon cycle, photosynthesis in plants takes CO₂ in the atmosphere and converts it into oxygen and carbon-based plant matter, storing the carbon captured from the atmosphere. Trees are significant sources of carbon storage and sequestration because of their size and longevity and provide essential habitat for local fauna. The most recent urban tree canopy assessment in San Diego region, based on high-resolution Light Detection and Ranging (LiDAR), shows the City has approximately 22% existing urban tree canopy.⁸ This strategy focuses on the preservation and expansion of tree growth in



⁸ The assessment was done in 2014 for all urban areas in the San Diego County using method developed by University of Vermont and USDA Forest Service. https://www.sandiego.gov/sites/default/files/san_diego_tree_canopy_assessment_05oct2016.pdf

the City to increase the amount of carbon sequestered in hopes of offsetting CO₂ emissions generated by other sources to the extent feasible. Increased carbon sequestration and new tree plantings will also improve air quality through the capture of air pollutants, water quality through reduced erosion, biological resources by providing additional habitat and improved water quality, and community and public health through the provision of shade and positive impacts on mental health. Implementation of the Urban Forest Strategy would reduce the City's emissions by 5 MTCO_{2e} by 2020 and 23 MTCO_{2e} by 2030. Table 3-9 outlines the framework for this strategy.

Table 3-9 Strategy 7: Carbon Sequestration

Goal 7.1: Increase Urban Tree Cover		
City Action: CS-1 Develop and Implement an Urban Tree Planting Program		
Starting in 2018, develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs, to promote increased carbon sequestration by trees within the community.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	150 net new trees planted.	5
2030	650 net new trees planted, increasing the tree canopy coverage from 22 to 22.16 percent, an increase in overall tree canopy of 0.16 percent.	23

Supporting Measures for Goal 7.1:

- Continue turf management practices which specify the top-dressing of compost to increase carbon sequestration at City parks.
- Partner with schools to develop programs to educate students about planting trees.
- The City will continue to encourage developers to avoid the removal of any mature trees when a property is developed or redeveloped. If the removal of mature trees is unavoidable, trees are required to be replaced at a 1:1 ratio.
- When new parking lots are part of a development, trees are required to be planted at a ratio of one tree for every 5 parking spaces.
- Present to Council for consideration an ordinance to require and/or incentivize additional tree planting on private property throughout the city.
- The City will incentivize tree planting on private property by giving away tree seedlings during Arbor Day events.
- Supports regional LiDAR imagery data collection and analyze future LiDAR data to determine the overall increase in tree canopy as compared to the City CAP goals and targets.

Notes:

MTCO_{2e} = metric tons of carbon dioxide equivalent

Source: EPIC 2017.



CHAPTER 4

Implementation and Monitoring

This chapter outlines how the City of Encinitas (City) will implement and monitor the 2018 Climate Action Plan (2018 CAP) strategies, City actions, and supporting measures over time to reduce greenhouse gases (GHGs). To achieve the GHG emissions reductions described in Chapter 3, actions should also be continuously assessed and monitored to ensure that: 1) the actions are effective; 2) the 2018 CAP is on track to achieve GHG reduction targets; and 3) desired community outcomes are met.

A separate and detailed Implementation Plan was prepared in conjunction with the final draft of the 2018 CAP. The Final CAP, CEQA document, and the standalone Implementation Plan will be presented to City Council concurrently. The more detailed Implementation Plan identifies key costs to the City including staffing needs, budget, and funding sources. It also includes a timeline for implementation of each GHG reduction action and supporting measure. All actions and supporting measures requiring significant funding will be brought to City Council for consideration and approval, either through the City’s standard budget process or as an off-cycle budget request. This chapter provides a brief overview of the range of implementation needs and considerations for the 2018 CAP.



To adequately prepare an implementation strategy, this chapter assigns implementation timelines, staffing needs, funding needs, and relative cost where available. In terms of implementation timelines, actions and supporting measures were categorized into the following:

- Ongoing: already occurring or to occur in perpetuity.
- Short-term: within the next five years.
- Mid-term: within the next 10 years.
- Long-term: to occur beyond 10 years.

Specific timelines for action implementation will be delineated in the Implementation Plan. The cost to the City associated with each action and supporting measure was given values of low, medium, or high based on the anticipated level of resources, staffing, and time required to implement each action and/or supporting measure. Similarly, certain actions and measures may have associated costs for the community upfront that may be partially or wholly offset through increased efficiencies. Further, success of the 2018 CAP will require capital improvements, investments, and increased operations and maintenance costs. Definitions of the low, medium, and high descriptors are shown in the table below.

Relative Cost	Description
Low	Assumes that less than one full-time-equivalent employee and/or financing less than \$20,000 would be required to oversee implementation, and that sufficient incentives, subsidies, or rebates would be available to nearly offset the upfront cost of implementation to individuals or businesses
Medium	Assumes at least one full time equivalent employee, operational and maintenance costs and/or capital improvement financing between \$20,000 and \$100,000 would be required to construct new permanent facilities, and that private businesses or individuals would incur short-term costs of improvements, infrastructure, or employee training
High	Assumes need for more than one full time equivalent employees, operational and maintenance costs and/or capital improvement financing of \$100,000 or more would be required to construct new permanent facilities, and that private businesses or individuals would incur short-term and long-term costs of improvements,

Relative Cost	Description
	infrastructure, or employee training

4.1 Implementation Strategy

The recommended emission reduction actions and supporting measures were evaluated qualitatively to assess the cost, timeline, administrative and staffing needs, and responsible parties required for implementation. The City will incur costs to implement the actions and supporting measures proposed in the 2018 CAP. These include initial start-up, ongoing administration, and enforcement costs. While some actions and measures will only require funding from public entities, others will result in increased costs for businesses, contractors, and residents. However, most actions and measures provide substantial cost-savings in the long-term (e.g., improved energy efficiency will reduce energy costs over time). The City will be diligent in seeking cost-effective implementation and strategic funding opportunities while using partnerships to share the cost. Table 4-1 provides a summary of the relevant parties and responsible agencies, timeline, approximate costs to the City and community, and potential funding sources for implementation of each GHG reduction action and supporting measures.

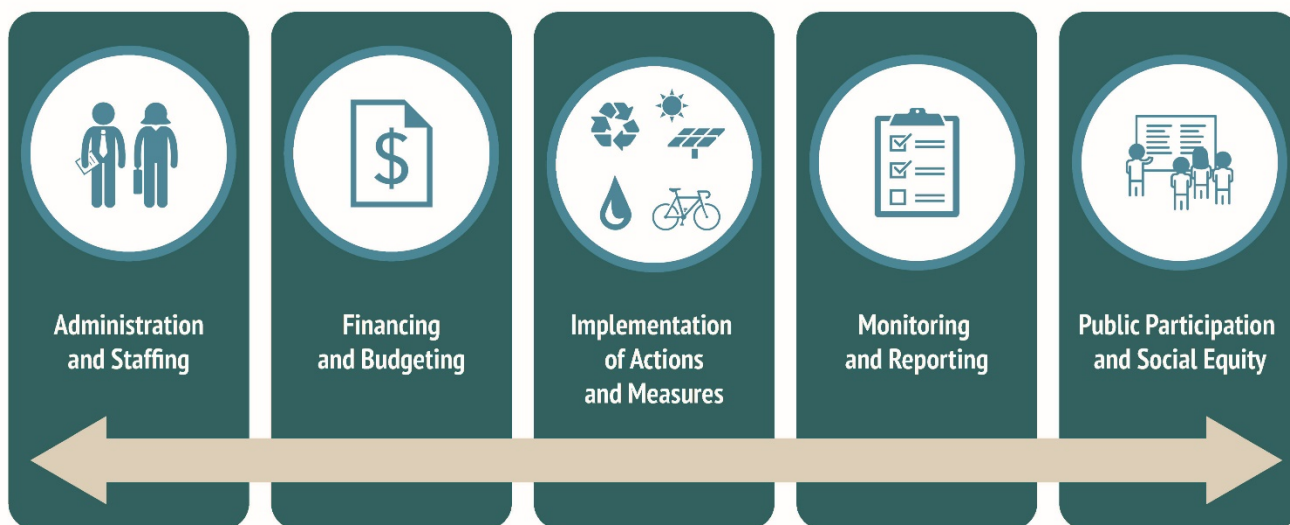
Proper implementation and tracking of the 2018 CAP allows City Staff, the Climate Action Working Group, City Council, and the public to monitor the effectiveness of each measure as well as the overall CAP.

A separate and detailed Implementation Plan was prepared in conjunction with the final draft of the 2018 CAP. The Final CAP, CEQA document, and the standalone Implementation Plan will be presented to City Council concurrently. The more detailed Implementation Plan identifies key costs to the City including staffing needs, budget, and funding sources. It also includes a timeline for implementation of each GHG reduction action and supporting measure. All actions and supporting measures requiring significant funding will be brought to City Council for consideration and approval either through the City's standard budget process or as an off-cycle budget request.

CAP Administration

The City will establish a permanent CAP Program Administrator position, or similar position, to ensure City Actions and Supporting Measures are implemented effectively and on time. The CAP Program Administrator will lead the overall implementation of the CAP and play a key role in implementing some of the most critical actions and supporting measures. The CAP Program Administrator will also be responsible for monitoring and reporting progress towards meeting 2018 CAP goals and emissions targets. Implementation of the 2018 CAP will be facilitated by appointed staff leads within various departments (see Table 4-1) and these staff leads would comprise the staff level CAP Workgroup. The CAP Program Administrator will manage the CAP Workgroup, convening and managing regular meetings to facilitate coordination of CAP implementation among the various City departments. The CAP Program Administrator will also seek regional funding, grant funding and other support such as the acquisition of a CivicSpark Fellow to assist with CAP implementation, monitoring and update. CivicSpark is an AmeriCorps program administered by the Local Government Commission to support local governments in addressing climate change.

If a project can demonstrate consistency with the land use projections and applicable GHG reduction measures in the CAP, the level of environmental review for the project required under CEQA with respect to GHG emissions can be considerably reduced.



KEY COMPONENTS OF IMPLEMENTING THE ENCINITAS CLIMATE ACTION PLAN

Social Equity

Incorporating equity into implementation of the CAP will be key to a successful outcome. Equity would ensure just distribution of the benefits of climate protection efforts and would help alleviate unequal impacts created by climate change. Social equity is a broad subject that transcends the CAP and intersects with multiple facets of City operations. However, the CAP presents an opportunity to begin addressing climate equity and laying the foundation for further action by the City. The City intends to address social equity in a holistic manner through its General Plan.

The City currently manages various programs to address equity in planning. The City of Encinitas Housing Authority operates a Section 8 Rental Assistance program for very-low income families. The City of Encinitas also receives an annual federal grant for the Community Development Block Grant Program (CDBG) program. Funds for the CDBG program are provided for affordable housing and community development activities within communities. The City also has an Inclusionary Housing requirement, whereby, developments of 10 or more units must provide affordable housing or pay an in-lieu fee to be used for affordable housing in the City.

The City will continue to incorporate equity considerations into implementation of the CAP. Local actions such as the Community Choice Energy (CCE) program and residential and commercial photovoltaic programs would create and promote jobs for the local workforce. The City will provide climate action related resources and knowledge-sharing opportunities for small-business owners at workshops and outreach events. The City will also consider low-income areas when locating and installing electric vehicle (EV) charging stations. Needs of underserved communities, such as low-income and seniors, would be considered when siting local transit shuttle routes and stops. Active transportation-related actions would be implemented to provide benefits to low-income populations, students, children, and other groups that do not have access to other transportation choices. The City is a participant in the North Coast Energy Action Collaborative, which supports energy savings for local businesses, including small businesses. The City would also partner with schools and local businesses to promote climate action. The City will also evaluate opportunities to install energy efficiency upgrades, photovoltaic systems, and EV charging stations at City-owned low-income housing. The City will actively prioritize actions and measures that include consideration of social equity. In preparing a holistic approach to equity, the City will develop tracking and reporting metrics to determine progress and success.

Green Jobs Creation

According to the Bureau of Labor Statistics, green jobs are defined as the following:

- A. Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.
- B. Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.

To provide support for the creation of green jobs within the City, the following measures will be implemented as part of the 2018 CAP:

1. The City's Economic Development effort, which serves to support local business development, will support the creation of green jobs through targeted workshops, customer service programs, funding of mainstreet and chamber associations and services offered via a business ombudsperson. In addition to green jobs, the CAP will support the "greening of jobs" by reducing the environmental impact of businesses associated with transportation, water use, energy use and solid waste generation.
2. The City will develop a Green Business Program for local businesses and restaurants. The program will include minimum participation requirements, awards for high achieving green businesses, the promotion of green jobs, and encouragement of local businesses to work on climate-related projects and programs through press releases, workshops, incentive programs, and social and other media outreach.
3. The City will facilitate the creation of green jobs through the promotion and support of the City's green business corridor, called the "[E³ Cluster](#)", which includes the Leichtag Foundation, the San Diego Botanic Garden, and the Encinitas Union School District Farm Laboratory. As the E³ Cluster develops, it will serve as a direct source of a significant number of additional green jobs within the City as well as promote and support other businesses and organizations to add green jobs throughout the City.
4. The City will track performance goals for green jobs and green businesses through the City's business license tracking system and report on green jobs and green businesses as part of the regular CAP monitoring report.
5. The City will provide efficiency and renewable energy training for the City employees responsible for the management of City facilities.
6. The City will ensure that all climate action-related work done through City programs comply with the California Statewide Prevailing Wage Ordinance, where applicable.
7. The City is currently in the process of updating its Housing Element to be compliant with State law. The updated Housing Element will include housing options for all facets of the City's workforce and will create a more sustainable live/work community. This more complete community will facilitate a reduction in vehicle miles traveled and encourage the use of greener transportation modes like biking, walking and public

transit. In compliment to the Green Business Program described above, these new residents could seek local employment and support the city's transition to a workforce made up of more local and green jobs.

Table 4-1 Implementation Strategy Matrix

City Action Number	City Action	Reductions in 2020 (MTCO _{2e})	Reductions in 2030 (MTCO _{2e})	Implementation Timeline	Cost		City Department/Division Responsibility
					City ⁹	Community	
BE-1	Require Energy Audits of Existing Residential Units	47	122	Short-Term, then Ongoing	Low	Low	Development Services/Planning
BE-2	Require New Single-Family Homes to Install Solar Water Heaters	130	1,241	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
BE-3	Adopt Higher Energy Efficiency Standards for Commercial Buildings	98	220	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
BE-4	Require Commercial Buildings to Install Solar Water Heaters	612	2,728	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
MBE-1	Continue Implementation of Energy Efficient Projects in Municipal Facilities	54	44	Mid-Term	Medium	Low	Public Works/Facilities
RE-1	Establish a Community Choice Energy Program	0 ³	43,644	Mid-Term	High	Low	City Manager/Environmental Services
RE-2	Require New Homes to install Solar Photovoltaic Systems	141	614	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
RE-3	Require Commercial Buildings to install Solar Photovoltaic Systems	59	452	Short-Term, then Ongoing	Low	Medium	Development Services/ Planning
MRE-1	Supply Municipal Facilities with Onsite Renewable Energy	233	746	Short-Term	Low	Low	Public Works/Facilities
WE-1	Complete Water Rate Study and Implement New Water Rates	712	735	Ongoing	Medium	Low	SDWD & OMWD

⁹ Administrative costs to the City to implement the CAP will be quantified in the Implementation Plan.³ Reductions for CCE are assumed to be zero for 2020 to allow time for program development and implementation.

Table 4-1 Implementation Strategy Matrix

City Action Number	City Action	Reductions in 2020 (MTCO ₂ e)	Reductions in 2030 (MTCO ₂ e)	Implementation Timeline	Cost		City Department/Division Responsibility
					City ⁹	Community	
CET-1	Complete and Implement the Citywide Active Transportation Plan	Non-Quantified	Non-Quantified	Long-Term	High	Low	Development Services/Planning & Development Services/Engineering
CET-2	Implement a Local Shuttle System	1130	172	Mid-Term, then Ongoing	High	Low	City Manager/Environmental Services
CET-3	Improve Traffic Flow	3,671	2,839	Mid-Term	High	Low	Development Services/Engineering
CET-4	Require Residential Electric Vehicle Charging Stations	185	1,357	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
CET-5	Require Commercial Electric Vehicle Charging Stations	440	1,789	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
MCET-1	Transition to Zero Emission Vehicle (ZEV) Municipal Fleet	55	370	Short-Term, then Ongoing	Low	Low	Public Works/Fleet
OR-1	Adopt a Leaf Blower Ordinance to Limit Use of 2-stroke Leaf Blowers	128	142	Short-Term, then Ongoing	Low	Low	Development Services/Engineering
ZW-1	Implement a Zero Waste Program	2,830	11,921	Mid-Term	High	Low	City Manager/Environmental Services
CS-1	Develop and Implement an Urban Tree-Planting Program	5	23	Short-Term, then Ongoing	Medium	Low	Public Works/Streets & Parks/Parks, Beaches, Trails

Notes: MTCO₂e = metric tons of carbon dioxide equivalent; SANDAG=San Diego Association of Government; SDG&E=San Diego Gas and Electric; EV=electric vehicle; PACE=Property Assessed Clean Energy; CSE=Center for Sustainable Energy; SDWD=San Dieguito Water District; CalRecycle=California Department of Resources Recycling and Recovery; OMWD = Olivenhain Municipal Water District

Actions and supporting measures considered to be a “project” subject to the environmental review process under the California Environmental Quality Act (CEQA) may be streamlined using a CAP Consistency Review Checklist. CEQA guidelines require that a project perform an analysis of GHG emissions and potential climate change impacts from new development. With associated CEQA coverage, the 2018 CAP qualifies under Section 15183.5 of the CEQA Guidelines as a plan for the reduction of GHG emissions for use in cumulative impact analysis pertaining to development projects. Demonstrating consistency with a CAP Consistency Review Checklist establishes that a project will not result in an “additional environmental effect” in the City’s initial study checklist. Projects that do not demonstrate consistency may, at the City’s discretion, prepare a more comprehensive project-specific analysis of GHG emissions consistent with CEQA requirements. The Consistency Review Checklist will be prepared concurrent with CEQA review for the 2018 CAP.

4.2 Monitoring and Updates

The 2018 CAP presents a broad-based strategy to reduce GHG emissions and improve the sustainability and resilience of the community. However, the 2018 CAP will need to be updated and maintained if it is to remain relevant and effective. Thus, City staff will need to evaluate and monitor plan performance over time and make recommendations to alter or amend the plan if it is not achieving the proposed reduction targets. This will include periodic GHG emissions inventory updates and analyzing action and supporting measure performance.

The 2018 CAP is a dynamic document that will be continuously assessed and monitored. Regular monitoring and performance measuring of activities will allow the City to make timely adjustments to existing actions; replace ineffective or obsolete actions; or add new actions as technology, federal and State programs, and circumstances change. Adjustments will be made to the 2018 CAP if actions fall short of the targets or additional actions become available. As new data and resources, future federal and State legislation and regulations, improvements in energy and efficiency technology, new regional plans, updates to building standards, or new GHG emission calculation standards become available, the City may amend the 2018 CAP to provide additional flexibility or clarity. The City recognizes that flexibility in implementation is necessary to allow the City to evolve its strategies to achieve the most effective CAP.

Over time, new technology will become available and new federal and State laws will influence how GHG emissions are reduced. The City will need to be flexible to ensure the CAP remains effective and relevant.

4.2.1 CAP Monitoring Report

It is anticipated that the City will spend two years after the 2018 CAP’s adoption in January 2018 for initial start-up and to initiate data tracking. The City will conduct ongoing monitoring beginning in 2019 to track progress and identify where further efforts and additional resources may be needed. A monitoring report that summarizes the ongoing monitoring will be presented to the Environmental Commission and City Council biannually, which will include the status of action implementation using monitoring metrics and the progress in meeting the reduction targets.

Pursuant to Step 7 of the 2011 CAP’s Implementation Plan, the City has developed and implemented a systematic reporting process to inform decision makers and the public through an online GHG “dashboard,” which provides an annual report of measurements, monitoring, and management of key CAP activities. The CAP dashboard serves as a performance monitoring tool and can assist staff and policy makers in making objective decisions regarding CAP implementation. The CAP dashboard can be viewed here: www.EncinitasEnvironment.org.

4.2.2 Greenhouse Gas Emissions Baseline Inventory Updates

While based on extensive research and analysis, the City’s GHG inventory represents a snapshot in time. As technologies and markets change, and the City implements the actions and supporting measures in the 2018 CAP, new inventories will be prepared to track progress. As a result, the GHG inventory will be updated on a regular basis for an updated baseline year using current data and assumptions. Through the climate planning services offered via its Energy Roadmap Program, the San Diego Association of Governments (SANDAG) will be updating GHG emissions inventories every two years, beginning with the 2016 baseline year. To remain consistent with SANDAG’s schedule, the City will coordinate updates to its GHG inventory every two years beginning with the 2016 baseline year following adoption of the 2018 CAP. The GHG inventory updates will provide information about emission reductions over time, in comparison to the 2012 baseline inventory and 2020, 2030, and 2050 emission projections.

4.2.3 CAP Updates

Based on the findings from the monitoring reports and inventory updates, the City will continue to prepare CAP updates every five years beginning in 2023. Future CAP updates will be guided by recommendation by the City Council and Environmental Commission and will include updated baseline inventories, adjustments to reduction actions and supporting measures, as necessary, and any changes to land use projections to achieve consistency with zoning and then-current General Plan land use designations and policies.

CAP Implementation and Monitoring Schedule	
2018	CAP Adopted Council adopts CAP and staff begins to implement actions and supporting measures.
2018	Begin Implementation and Monitoring Staff performs initial start-up tasks and implementation of data tracking.
2018	GHG Emissions Baseline Inventory Update Staff conducts an update to the emissions inventory every two years, starting with the 2016 baseline year, consistent with SANDAG’s Energy Roadmap Program timeline.
2019	Annual CAP Monitoring Report Staff prepares and presents first annual monitoring report to City Council and Environmental Commission assessing the CAP’s annual performance in achieving targeted goals.
2023	CAP Update Based on findings from the annual monitoring reports and inventory updates, staff prepares a CAP update every five years.

4.3 Ongoing Engagement

As the City continues to implement and monitor progress on the 2018 CAP, continued engagement with and participation by the community is critical. This includes individual residents and businesses, community organizations, schools, developers, property owners, other local and regional government agencies, and others. While the 2018 CAP focuses on actions and measures in which the City has a role, many of the actions and measures require partnerships and collaboration.



The City is also committed to public education about the important role individuals play in combatting climate change and its effects. Education and outreach is especially key for the younger generation, as they will be exposed to the worsening impacts of climate change. The Encinitas City Council has a School District Liaison Commission (SDLC) which facilitates collaboration with local school districts. Ongoing engagement for the CAP will include coordination and educational outreach to local schools and school children through the SDLC and other avenues. Effective and long-term climate action and resiliency in the City can only be achieved through efforts that continue to change the way individuals interact with the environment. Many of the actions and measures in Chapter 3, as well as the strategies outlined in Chapter 5, are focused on increasing community awareness and participation in existing programs or connecting the community with new information, tools, funding, or resources to act. Thus, the 2018 CAP serves as a resource that supports community-based action. To meet the City and State's GHG reduction goals, individual participation will be key. Further, the City's CAP Dashboard will provide a publicly available, up-to-date inventory for City residents and stakeholders facilitating engagement in CAP Update activities.



CHAPTER 5

Climate Adaptation

Climate change is a global phenomenon that, over the long term, will cause a wide variety of impacts on human health and safety, economic vitality, water supply, ecosystem function, and the provision of basic services (California Natural Resources Agency [CNRA] 2012:3). Locally in the San Diego region, as well as throughout California, climate change is already affecting and will continue to affect the physical environment. Because impacts of climate change vary by location and other social and economic characteristics, it is important to specifically identify the projected severity of these impacts on the City of Encinitas (City) and the surrounding area.

The California Adaptation Planning Guide (APG), developed by California Office of Emergency Services (CalOES) and CNRA, helps communities throughout California plan for and adapt to the impacts of climate change. The APG includes a nine-step process, illustrated in Figure 5-1, which allows communities to assess their specific climate vulnerabilities and provides strategies for communities to reduce climate-related risks and prepare for current and future impacts of climate change.

The first phase of the nine-step process focuses on preparing a Vulnerability Assessment, which is a method for determining the anticipated impacts of climate change on community assets and populations. This phase evaluates a community’s level of exposure to climate-related impacts and analyzes how these impacts will affect a community’s populations, functions, and structures. The second phase of the process uses the information gathered in the Vulnerability Assessment to develop adaptation strategies and measures to help the community prepare for, respond to, and adapt to local climate change impacts. The strategies support a collaborative planning process that involves a variety of City departments and State agencies, including, but not limited to, CalOES, CNRA, and the California Department of Public Health (CDHP). This chapter serves as an abbreviated version of a full Vulnerability Assessment, identifies key climate-related risks faced by the City, and provides key strategies to increase the City’s climate resilience and adaptive capacity.

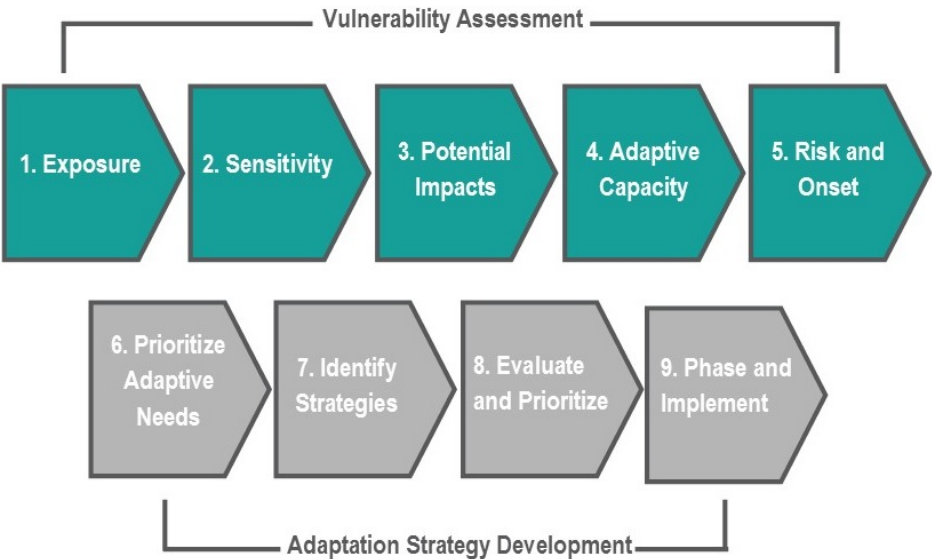


Figure 5-1: The Nine Steps in the Adaptation Planning Process

5.1 Climate Change Effects and Vulnerability Assessment

This section summarizes the climate-related impacts that may affect the City and evaluates how these impacts will potentially affect the community's populations, functions, and structures.

5.1.1 Climate Change Effects

The first step in the climate adaptation planning process is to assess the vulnerability of the City's populations, functions, and structures and the regional impacts of climate change. Using climate scenario planning tools, including Cal-Adapt and the U.S. Geological Survey's (USGS's) Coastal Storm Modeling System (CoSMoS 3.0), the assessment focuses on the climate-related impacts most likely to affect the City. Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission (CEC) and the University of California, Berkeley Geospatial Innovation Facility. Cal-Adapt downscales global climate simulation model data to local and regional resolution under both high and low global greenhouse gas (GHG) emissions scenarios. CoSMoS is a dynamic modeling tool developed to predict coastal flooding because it includes both future sea level rise and storms integrated with long-term coastal evolution. Data from the CoSMoS modeling tool are used specifically in sea-level rise predictions and serve to identify the City's key sea-level rise vulnerabilities.



The projections included in the Vulnerability Assessment discuss impacts that the City will experience from mid-century to the end of the century (2050-2099). Climate-related impacts are included for both a Low-Emissions Scenario and a High-Emissions Scenario based on predictive scenarios included in the Intergovernmental Panel on Climate Change's (IPCC's) Fifth Assessment Report (AR5) published in 2014. The Low-Emissions Scenario assumes GHG emissions will peak around the year 2040 and begin to decline steadily. The High-Emissions Scenario assumes GHG emissions continue to rise strongly through 2050 and plateau around the year 2100.

The direct, or primary, changes analyzed for the City include average temperature, annual precipitation, and sea-level rise. Secondary impacts, which can occur because of individual changes or a combination of these changes, are also assessed and include extreme heat and its frequency, wildfire risk, and changes in hydrology (CNRA 2012:16-17).

Increased Temperature

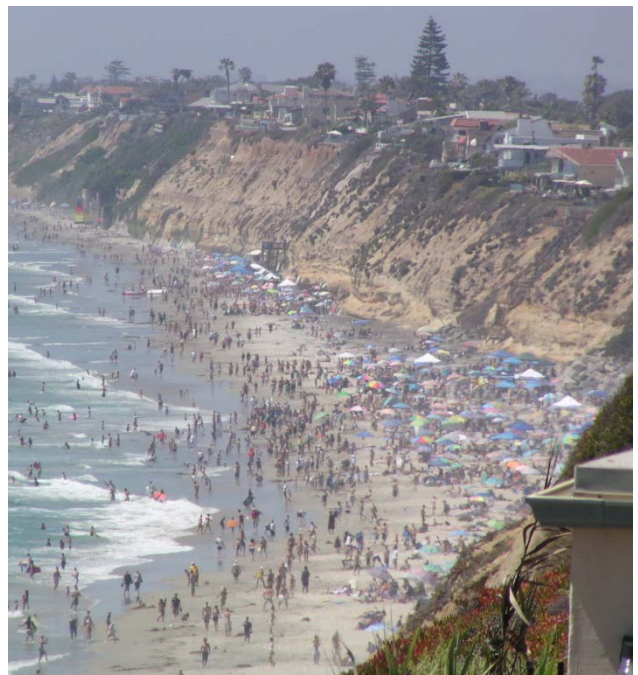
Annual temperatures in the City are projected to increase steadily under both emissions scenarios. The City's historical average annual maximum temperature, based on data from 1950 to 2005, is 73.8 degrees Fahrenheit (°F). Under the Low-Emissions Scenario, annual average maximum temperature is projected to reach 77.5 °F by 2050 and 78.3 °F by 2099, a total increase of 4.5 °F (CEC 2017a). The annual average maximum temperature under the High-Emissions Scenario is projected to be 78.2 °F by 2050 and 83.1 °F by 2099, a total increase of 9.3 °F (2099) (CEC 2017b).

The City's historical average annual minimum temperature, based on data from 1950 to 2005, is 52.4 °F. Under the Low-Emissions Scenario, annual minimum temperature is projected to be 55.8 °F by 2050 and 57.4 °F by 2099, a total increase of approximately 5 °F (CEC 2017c). The annual average minimum temperature under the High-Emissions Scenario (where emissions continue to rise strongly through 2050 and plateau around 2100) is projected to reach 56.5 °F by 2050 and 61.5 °F by 2099, an increase of approximately 9.1 °F (CEC 2017d).

In urban areas, increased average temperatures, as well as more frequent and extreme heat events, can exacerbate the effects of urban heat islands. Urban areas are characterized by the predominance of asphalt, paved surfaces, and buildings combined with limited vegetation and green space. During periods of high temperatures, asphalt and darker surfaces tend to absorb and retain heat for longer periods of time. These effects can be exacerbated by activities such as operating vehicles, air conditioning units, as well as industrial activities. This phenomenon raises average temperatures in urban areas and is known as the Urban Heat Island Effect (UHIE). The UHIE can impact a City in several ways, including increased energy demand for cooling, decreased ambient air quality, and increased heat-related public health risks such as heat stroke, dehydration, and exposure to degraded air quality.

Increased Frequency of Extreme Heat Events and Heat Waves

Cal-Adapt defines the "extreme heat" day threshold for the City as 93.3 °F or higher. Historically (i.e., between 1960 and 2005, within the warmer season of April 1st through October 31st, where the maximum temperature exceeds the historical maximum temperatures), the City has experienced an average of four extreme heat days annually. Because of climate change, the number of extreme heat days is projected to increase substantially by 2099. Under the Low-Emissions Scenario, the City is projected to experience an average of 12 extreme heat days per year between 2090 to 2099, an increase of about eight days (CEC 2017e). Under the High-Emissions Scenario, the City is projected to experience an average of 37 extreme heat days per year between 2090 to 2099, an increase of about 33 days (CEC 2017f).



Heat waves can be defined as five or more consecutive extreme heat days. These events have been historically infrequent in the City, with no more than two heat waves occurring in a year. Climate change will likely cause a considerable rise in the frequency of heat waves in the City under both emissions scenarios. Under the Low-Emissions Scenario, projections show an increase of heat wave events, with roughly four per year at the middle of the century and up to seven per year in 2099. The High-Emissions Scenario also shows an increase in annual heat wave events, with up to five heat wave events occurring annually by midcentury and as high as 10 heat wave events occurring annually by 2099. Along with an increased frequency of heat events, heat waves are also projected to occur both earlier and later in the season. In the historic record, heat waves have started in August and ended in October; in the future, they will extend from June through October.

Increases in the severity and length of extreme heat events caused by climate change will affect the City's assets and population in several ways. Heat waves and extreme heat events, intensified by the UHIE, produce a number of public health risks, particularly for vulnerable populations including children, the elderly, and those who work outside (e.g. construction workers, agricultural workers). Heat waves and extreme heat events can cause a number of heat-related illnesses including heat cramps, heat exhaustion, and heat stroke, leading to increased hospital visits and emergency services.

Changes in Precipitation Patterns

While projections generally show little change in total annual precipitation in California, even modest changes could have a dramatic effect on California's ecosystems, which are conditioned to historic precipitation levels. Changes in weather patterns resulting from increases in global average temperatures could also result in a decreased proportion of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Based on historical data and modeling, the California Department of Water Resources (DWR) projects that the Sierra Nevada spring snowpack will decrease by 25 to 40 percent from its historic average by 2050 and 48 to 65 percent by 2100 (DWR 2008:4, 2013:3-64). If GHG emissions continue unabated (i.e., the High-Emissions Scenario), the Sierra Nevada spring snowpack could decline by as much as 70 to 90 percent by 2100 (CEC 2017g).



Using Cal-Adapt's Annual Averages Tool, historical annual average precipitation in the City from 1950 to 2005 is estimated to be 10.9 inches. Under the Low-Emissions Scenario, annual precipitation in the City is projected remain or decrease slightly by 2050 (10.8 inches per year by 2050), and increase slightly to 11.6 inches per year by 2099, a rise of 0.7 inches per year (CEC 2017h). Under the High-Emissions Scenario, annual precipitation in the City is projected to increase to 11.1 inches by 2050 and 14.5 inches by the end of the century (2099), a total rise of 3.6 inches (CEC 2017i).

Increased temperatures, particularly in the Sierra Nevada region, which supports the State Water Project, as well as the Rocky Mountains, which heads the Colorado River, will lead to earlier and faster snowmelt and could leave the City vulnerable to water resource fluctuation during historically dry months (July-September). Additionally, as temperatures rise and snowpack decreases, the dry season may manifest earlier in the year and extend later, leading to a longer season of water insecurity. Further, as the climate warms, precipitation will fall more often at high elevations as rain rather than snow, which will reduce the Sierra Nevada and Rocky Mountain snowpacks that the City and surrounding regions need for surface water supply.

Increased Wildfire Risk

The City's landscape consists of rugged coastal terrain and includes one low-lying coastal ridge. There are several open space areas within the City, characterized by shrubs and native trees. During the dry months, the wildfire risk in these open, vegetated areas can increase when exacerbated by occasional Santa Ana winds and high temperatures. Additionally, extreme weather

conditions, such as high temperature, low humidity, and/or winds of extraordinary force, may cause an ordinary, localized fire to expand into a more intense and difficult to control wildfire. Currently, many homes within Encinitas are located in the urban-wildland interface (UWI), which is characterized by zones of transition between wildland and developed areas and often include heavy fuel loads that increase wildfire risk. These areas within Encinitas include neighborhoods near Saxony Canyon, South El Camino Real/Crest Drive, and Olivenhain. Most recently, the 1996 Harmony Grove wildfire in Encinitas resulted in the loss of three homes and the evacuation and sheltering of hundreds of Encinitas residents (San Diego County Multi-Jurisdictional Hazard Mitigation Plan [MHMP] 2015:5-80).

Increased temperatures and changes in precipitation patterns associated with climate change are expected to increase the risk of wildfire in the City. Cal-Adapt's Wildfire Tool can predict the potential increase in the amount of area at risk of burning through the year 2085, as compared to 2010 conditions. Under the Low-Emissions Scenario, the amount of area at risk of burning relative to 2010 levels would be approximately 1.3 percent greater in 2020 and remains similar through 2085. Under the High-Emissions Scenario, the amount of area at risk of burning remains at approximately 1.3 percent greater in 2020 and decreases slightly to 1.2 in 2085. Based on Cal-Adapt's Wildfire Tool, this increase in burned area is most likely to occur in eastern portions of the City, such as Lux Canyon, Saxony Canyon, the Manchester Preserve, and the areas surrounding Escondido Creek (CEC 2016j).

The California Department of Forestry and Fire Protection (CAL FIRE), in collaboration with the City, has developed the City's Fire Hazard Severity Zone Map, identifying Very High Fire Hazard Severity Zones (VHFHSZ) in the City that are included in the Local Responsibility Area (LRA) (See Appendix F). The map identifies three key areas in the City included in the VHFHSZ. The areas include the neighborhoods surrounding Saxony Canyon and the Encinitas Ranch Golf Course, neighborhoods surrounding and to the northeast of the Val Sereno Preserve, and properties directly north of San Elijo Lagoon near Interstate 5. Due to the topography and vegetation of these locations, surrounding properties are at increased risk of wildfire and associated hazards.



In addition to increased threats to human safety, the increased frequency of wildfire results in the release of harmful air pollutants into the atmosphere, which dissipate and can affect the respiratory health of residents across a broad geographical scope. Particulate matter (soot and smoke), carbon monoxide, nitrogen oxides, and other pollutants are emitted during the burning of vegetation, and can cause acute (short-term) and chronic (long-term) cardiovascular and respiratory illness, especially in vulnerable populations such as the elderly, children, agricultural and outdoor workers, and those suffering from pre-existing cardiovascular or respiratory conditions.

Additionally, wildfire can cause direct and indirect damage to electrical infrastructure. Direct exposure to fire can sever transmission lines, and heat and smoke can affect transmission capacity. Furthermore, because of historical forest management trends over the past century, increased temperatures, and more frequent drought, California wildfires are characteristically hotter and more intense as compared to naturally occurring fire regimes. As such, soil structure and moisture retention are damaged leading to increased susceptibility to erosion or landscapes.

Increased Likelihood of Flooding

Climate change is predicted to modify the frequency, intensity, and duration of extreme storm events, such as sustained periods of heavy precipitation and increased rainfall intensity during precipitation events. These projected changes could lead to increased flood magnitude and frequency (IPCC 2001:14). Currently, the City experiences localized flooding in several areas during heavy rainfall and extreme weather events. These areas include “Restaurant Row” in Cardiff (south of San Elijo State Beach Campgrounds), Encinitas, and Cottonwood Creek and low-lying areas of Leucadia and Old Encinitas. Historically, the City has experienced property-related losses and damage because of localized flooding in Leucadia and coastal flooding in portions of Cardiff. Specifically, winter storms in 1997, 2005-2006, and 2010-2011 caused damage resulting in approximately \$500,000 in recovery and cleanup costs from the Federal Emergency Management Agency (FEMA) (MHMP 2015:5-81).

According to Cal-Adapt’s Annual Averages Tool, average annual precipitation in the City is currently 10.9 in. As discussed previously, annual average precipitation in the City is likely to remain the same under a Low-Emissions Scenario and increase slightly under a High-Emissions Scenario. Several factors determine the severity of floods, including rainfall intensity and duration. Flash floods occur when a large amount of rain falls over a short period of time. When accounting for a 125 centimeter (cm) increase in mean sea level by 2099 in CoSMoS, the City is likely to experience an increase in flood-prone low-lying areas. The majority of the area subject to this increased flood risk is located in and around the San Elijo Lagoon State Marine Conservation Area (USGS 2013).

The City’s flooding potential will also be exacerbated when experiencing atmospheric rivers, or narrow streams of warm, concentrated precipitation often resulting in the deposition of considerable rainfall over a short period of time. Under higher emissions scenarios wherein temperatures are expected to increase more when compared to lower emissions scenarios, the intensity and magnitude of atmospheric rivers are expected to become more severe, resulting in increased regional and localized flooding (Dettinger 2011).

During flooding events, infrastructure (e.g., roadways, power lines) may be damaged, in turn disrupting communications, energy transmission, public services, and transportation systems. Floodwaters during storm events can interact with sources of pollution and distribute hazardous pollutants locally and regionally. The resulting water contamination may lead to human health impacts as well as degradation of ecosystems. Flood events can also cause considerable property damage through flooding damage, as well as structural damage, through erosion and increased risk of mudslides. In consideration of these efforts, aside from the following proposed strategies, the City should continue to participate in updates to the MHMP when appropriate to comprehensively assess and plan for all local hazards that may be intensified by climate change.

Sea-Level Rise

An important impact of global climate change is sea-level rise. The average global sea-level rose approximately 7 inches during the last century. If sea-level changes along the California coast continue to reflect global trends, sea-level along the State’s coastline in 2050 could be 10-18 inches (0.25-0.45 meters [m]) higher than in 2000, and 31-55 inches higher (0.78-1.4 m) than 2000 levels by the end of this century (CEC 2012:9). According to the MHMP for the region, sea-levels measured in La Jolla show a 6-inch rise over the last century (OES 2015a).

Considering the City's location, which runs along the coastline, sea-level rise is an important concern for potential climate-related risks. Sea-level rise may endanger the City in several key ways, including property damage to development along the coast; damage to transportation, electrical, and wastewater infrastructure; and compromised or lost public access to the coast. Sea-level rise can also have considerable effects on coastal ecosystems, such as rocky intertidal areas, beaches, dunes, wetlands, estuaries, lagoons and tidal marshes, tidal flats, eelgrass beds, and tidally-influenced streams and rivers (CCC 2015). Impacts can include coastal bluff erosion; alterations in long-shore sediment transport; and salt water intrusion into wetlands, estuaries, and aquifers.



Historically, the City has already experienced considerable coastal erosion from El Niño storms in 1982-1983, which eroded sand from beaches by up to 20 feet (ft.) in depth, structurally compromising bluffs and damaging coastal homes in the City. Segments of shoreline along Moonlight Beach and Cardiff-by-the-Sea are at great risk of coastal inundation from storm wave run-up with future sea-level rise. Destabilized coastal cliffs at Stonesteps Beach caused a bluff failure, resulting in a fatality. Public safety is the top priority for Encinitas so reducing the possibility of bluff failures is of the highest importance.

The City, in collaboration with the San Diego Foundation and Local Governments for Sustainability (ICLEI), is in the process of developing the San Diego Regional Coastal Resilience Assessment, a report to assess the vulnerability of coastal assets in Encinitas. The report uses CoSMoS to assess potential sea-level rise impacts on the City and surrounding area. The report identifies potential risks from sea-level rise to key assets in the City including the building stock, stormwater infrastructure, wastewater treatment systems, transportation infrastructure, beach and coastal access, and local ecosystem health.

As noted in the San Diego Regional Coastal Resilience Assessment, a 2012 National Research Council report projected sea-level rise in the San Diego region to rise 4-30 centimeters (2-12 inches) by 2030, 12-61 centimeters (5-24 inches) by 2050, and 42-167 centimeters (17-66 inches) by 2100, relative to 2000 levels. Based on this and other sea-level rise studies considered, this report utilizes a 50 centimeter increase in sea-level by 2050, and a 200 centimeter rise in sea-level by 2100. As the report notes, these higher-end sea-level rise scenarios have been chosen to encourage a risk-averse approach to planning for sea-level rise resilience.

Through the use of a Vulnerability Assessment specific to sea-level rise, the Regional Coastal Resilience Assessment provides information on how sea-level rise will affect the City. Table 5-1 provides brief summaries of the key areas within the City that may be affected by sea-level rise. Full descriptions of these impacts are provided in the San Diego Regional Coastal Resilience Assessment.

Table 5-1 Potential Sea-Level Rise Impacts in Encinitas for 2050 and 2100

Impact Sector	Vulnerability Areas
Buildings Stock	<ul style="list-style-type: none"> Low-lying areas surround San Elijo Lagoon Erosions impacts to residential areas near Sea Cliff County Park
Social Sector	<ul style="list-style-type: none"> Census tract 177.02, located North of B Street and South of Leucadia Street Census tract 177.01 North of Leucadia Street may be adversely impacted by and have difficulty revering from sea-level rise impacts due to high unemployment rates in this area. Declines in tourism are expected to directly impact service-economy employees
Storm Water	<ul style="list-style-type: none"> Storm water systems north and west of San Elijo Lagoon (See Figure 5.2) and outlets on Moonlight Beach will be impacted by 2100. Cliff retreat has a high potential impact on the stormwater system, including for inlets and outlets west of South Coast Highway 101 between San Elijo Lagoon and Sea Cliff County Park.
Wastewater	<ul style="list-style-type: none"> By 2100, flooding is projected to impact Cardiff Sewer Pump Station, sewer system infrastructure surrounding San Elijo Lagoon, wastewater infrastructure at Moonlight Beach, and two lift stations in Batiquitos Lagoon. Higher water levels could potentially cause sewer spills into environmentally sensitive areas, such as the mouth of San Elijo Lagoon.
Drinking Water	<ul style="list-style-type: none"> By 2100, aboveground water distribution components, such as valves, meters, and service points north and west of San Elijo Lagoon will be exposed to impacts of flooding.
Transportation	<ul style="list-style-type: none"> Sections of Highway 101 near San Elijo Lagoon with experience flooding impacts by 2050 and 2100. Erosion is projected to impact Coast Highway 101 south of the Self-Realization Fellowship Temple and local roads along the coastal bluff, including Neptune Ave and 4th Street.
Beach and Public Access	<ul style="list-style-type: none"> Boneyard Beach and D Street Beach, located south of Moonlight Beach, also are projected to experience shoreline change. Cardiff State Beach-Seaside and Cardiff State Beach-North Beach are located along the San Elijo Lagoon, which is projected to be impacted by flooding and shoreline change.
Biodiversity and Habitat	<ul style="list-style-type: none"> Eighty-six species within the study area are categorized as sensitive species, including the California Least Tern, the Western Snowy Plover, and the Ridgway Rail.

Source: San Diego Regional Coastal Resilience Assessment Draft Report (2017)

5.2 Current Adaptation Efforts

The City is addressing many of the challenges associated with climate change impacts through existing local policies, plans, programs, resources, and institutions. As highlighted in the 2015 MHMP, the City has begun to identify existing plans and policies, and key City staff, which can contribute to the City's climate adaptation efforts. As part of the MHMP, the City has adopted several Goals, Policies, and Objectives relevant to climate adaptation. As the City continues to conduct current and future planning efforts, it is critical that climate change and climate-related risks are incorporated into efforts to protect City residents and create a climate resilient community. The following sections discuss how the City is currently working to address each of the climate-related impacts.



Figure 5-2: Annual wave impacts in San Elijo State Beach (2099) (The locations marked in yellow highlight areas where increased erosion is expected.)

Source: USGS 2013

Efforts Related to Increased Temperature and Extreme Heat Events

The 2015 MHMP included several objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal 7 of the 2015 MHMP Chapter on Encinitas intends to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of severe weather, including extreme heat” (MHMP 2015:5-97). The goal includes three corresponding objectives and seven actions to help the City prepare for the impacts of extreme heat events. Objectives and actions focus on urban heat islands, vulnerable populations susceptible to extreme heat, and emergency services.

Efforts Related to Changes in Precipitation Patterns

Goal 8 of the MHMP Chapter on Encinitas is intended to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to drought” (MHMP 2015:5-98). The goal includes four corresponding objectives and 11 actions to help the City prepare for the impacts of drought events. Objectives and actions focus on protecting assets that may be damaged by drought (e.g. trees, landscaping), and increasing the use of recycled water for City landscaping and educating citizens about drought preparedness.

The City relies on a combination of water resources to support the City’s water services. The City is served by two water districts. San Dieguito Water District (SDWD) supplies potable water to approximately 38,000 residents within the City and the remainder of the City is served by the Olivenhain Municipal Water District (OMWD). The City receives raw water resources from several sources, including Lake Hodges and the San Diego County Water Authority (SDCWA). SDWD has a Water Conservation Division, which administers outreach, education, and incentive programs to help residents and businesses reduce water consumption in the District. The City also uses recycled water from the San Elijo Water Reclamation Facility to irrigate City-owned facilities, such as the Encinitas Ranch Golf Course and landscaped traffic medians in the City. For each water district, the proportion of water from each source can vary significantly from year to year. For example, in the San Dieguito Water District, on average, approximately 30% of the water supply comes from Lake Hodges, 60% of the water supply is imported from the Colorado River and State Water Project, and 10% is recycled water from the San Elijo Joint Powers Authority.

Efforts Related to Increased Wildfire Risk

Goal 4 of the MHMP Chapter on Encinitas is intended to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure and City-owned facilities, because of wildfires/structural fires” (MHMP 2015:5-93). The goal includes three corresponding objectives and 16 actions to help the City prepare for the impacts of wildfire events. Objectives and actions focus on improving emergency response efforts related to wildfires, protecting key City assets susceptible to wildfire impacts, and educating residents about wildfire preparedness.

In 2008, the City of Encinitas Fire Department received a FEMA Fire Prevention and Safety Grant to conduct a public education program to educate Encinitas residents on defensible spaces, firewise gardening techniques, and how best to protect homeowners from wildfires. The program included a defensible space miniature exhibit house and garden at San Diego Botanic Gardens.

In 2013, the City worked with CAL FIRE, to develop the City’s Fire Hazard Severity Zone Map. The map identifies the VHFHSZ within the City, locating regions in the City at increased risk of wildfire risk and related hazards.

Efforts Related to Increased Likelihood of Flooding

Goal 5 of the MHMP Chapter on Encinitas aims to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of flooding/dam failure” (MHMP 2015:5-94). The goal includes four corresponding objectives and 19 actions to help the City prepare for the impacts of flooding events. Objectives and actions focus on improving local and regional emergency response efforts related to flooding, protecting key City assets susceptible to flooding impacts, educating residents about flooding preparedness, and improving building and development standards to prevent flood risk.

Efforts Related to Sea Level Rise

While the MHMP does not include a specific goal about sea-level rise, Goal 6 does mention sea-level rise: “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of coastal erosion/coastal bluff failure/storm surge/tsunami/sea-level rise (MHMP 2015:5-97). The objectives and actions included under this goal will serve to better prepare the City for sea-level rise and its consequences, such as coastal erosion, increased storm-wave run-up, beach loss, and slope failure on coastal bluff faces. Objectives and actions under this goal focus on protecting key City assets susceptible to coastal erosion, better plan and prepare for coastal erosion and storm surge events, and educate citizens about the risks of coastal erosion, coastal bluff failure, storm surge, tsunamis, and sea-level rise.

In 2012, ICLEI published the Sea-Level Rise Adaptation Strategy for San Diego, a regional climate adaptation planning document focused on strategies to prepare the region for sea-level rise. As the report notes, by mid-century the San Diego region will experience “regularly-occurring inundation of certain locations and assets, some of which are being planned and built today” (ICLEI 2012: iv). The report also highlights the most vulnerable aspects to the region as stormwater management, wastewater collection, shoreline parks and public access, transportation facilities, commercial buildings, and ecosystems (ICLEI 2012). Building upon the 2012 report, the San Diego Regional Coastal Resilience Assessment will evaluate the impacts of sea-level rise on coastal Encinitas and provides tailored adaptation strategies to help the City prepare for these impacts. This document will serve to help the City in future sea-level rise planning efforts and help the City become more resilient to the long-term impacts of sea-level rise and climate change.

The City is currently working on a series of Encinitas-specific planning efforts to increase community and local ecosystem resiliency to the impacts of sea-level rise.

Cardiff Beach Living Shoreline Project

In collaboration with the State Coastal Conservancy and the California State Parks, the City is currently working to develop the Cardiff Beach Living Shoreline Conceptual Plan. The plan supports efforts for a local dune restoration project to restore heavily impacted coastal habitat and provide natural sea-level rise adaptation by protecting a vulnerable segment of Cardiff Beach. Currently in the development phase, the plan will provide innovative approaches for climate resiliency and sea-level rise adaptation, buffering the City from storm surge and flooding during extreme weather events.



Figure 5-3: Cardiff Beach, Encinitas, CA

Source: City of Encinitas 2017

U.S. Army Corps of Engineers Coastal Storm Damage Reduction Project

The City of Encinitas and Solana Beach have partnered to bring a 50-year beach nourishment project with the support from the US Army Corps of Engineers and the State Parks and Recreation Department. This project would provide stability and resiliency to the coastline for the next 50 years.

Opportunistic Beach Fill Program

The Opportunistic Beach Fill Program identifies construction project that export sandy beach material and then haul the material to the beach at Moonlight, Cardiff, Leucadia or Ponto State Beach. The City works with developers to conduct monitoring and permitting and share the cost for hauling the material to the beach.

San Elijo Lagoon Restoration Project

The San Elijo Lagoon Conservancy, in coordination with the City and relevant State agencies, will soon begin work on the San Elijo Lagoon Restoration Project. The project consists of selective dredging and filling of the mudflats and salt marsh habitat within the lagoon, intended to improve tidal circulation and restore sensitive habitats currently compromised by surrounding land uses. Once completed, the project will provide continuity of habitats currently threatened by sea-level rise and provide increased adaptive capacity for the surrounding communities during flooding and extreme weather events. This project will add 300,000 cubic yards of material to the beach and nearshore environment which will improve coastal resiliency for years.



Figure 5-4: San Elijo Lagoon near Encinitas, CA

Source: San Elijo Conservancy Website Courtesy of Chris Hoover

5.3 Resiliency and Adaptation Strategies

This section outlines strategies for the City for improving community resiliency and adaptation to the current and future impacts of climate change. These strategies can also be considered for incorporation into the next update of the City's Safety Element of the General Plan, pursuant to the requirements of SB 379 (Statutes of 2016), as well as in future updates to the MHMP to further its climate adaptation efforts. Future planning efforts in the City will use these proposed strategies to better integrate climate adaptation planning efforts into all relevant plans, policies, and programs.

Adaptation strategies are classified into five categories to address the climate change impacts identified in the vulnerability assessment (i.e., temperature, precipitation, flooding, wildfire, and sea-level rise). Each category includes programs and policies to support climate resiliency and adaptation, focusing on specific vulnerabilities and impacts that have the potential to impact the community's populations, functions, and structures. The proposed strategies also have the potential to provide other important benefits to the community, or co-benefits.

Strategies are categorized as follows:

- Prepare for Increase in Temperatures and Extreme Heat
- Prepare for Changes in Precipitation Patterns and Water Supply
- Prepare for Increased Wildfire Risk
- Prepare for Increase Flood Risk
- Prepare for Sea-Level Rise

5.3.1 Prepare for Increases in Temperature and Extreme Heat

Rising temperatures caused by climate change will exacerbate the UHIE and increase the frequency and duration of extreme heat events. The City will take actions to mitigate temperature-related effects and improve heat resiliency to protect its populations, functions, and structures in the short- and long-term. To mitigate the impacts of the UHIE, the City will implement the following strategies which also provide co-benefits to the community.

- **Strategy 1:** Incorporate green infrastructure strategies into new and existing infrastructure to mitigate the effects of the UHIE by reducing the area of heat-absorbing paved surfaces and increasing landscaped area with planted vegetation, including shade trees. Examples of green infrastructure include street trees, climate-appropriate landscaping, green and cool roofs, and heat-reflective surfaces and materials. These actions will decrease instances of heat-related illness, improve air quality, and lower energy costs associated with indoor cooling.
- **Strategy 2:** Promote the use of solar carports on new and existing surface parking lots to mitigate heat absorption and increase shaded areas for the City's population. Implementation priority will be given to City-owned parking lots to serve as example solar carports. Solar carports would additionally provide GHG-reducing co-benefits by increasing distributed solar generation and, if electric vehicle charging stations are added, improving charging accessibility.
- **Strategy 3:** Promote the use of passive cooling design (e.g. appropriate building orientation, shade trees, window shading, cool roofs) and use the California Building Standards Code (CalGreen) voluntary measures for residential and nonresidential buildings to improve energy efficiency. Other energy efficiency measures (e.g. air sealing improvements, whole house fans, energy efficient air-conditioning units) should be encouraged in new development within the City to reduce demand for air conditioning and help reduce energy costs.

The City will pursue the following strategies to protect the City residents from extreme heat events, focusing attention on the vulnerable populations most at risk from these events.

- **Strategy 4:** Conduct outreach to educate City residents on the health risks associated with extreme heat events and strategies to prepare for these events. Alongside general outreach, particular focus should be given to educating populations vulnerable to extreme heat including children and the elderly.
- **Strategy 5:** Coordinate with relevant agencies including, but not limited to, the San Diego County Office of Emergency Services, San Diego Unified Disaster Council, and San Diego Fire Department to better plan and prepare for extreme heat events and the increased demand for emergency services associated with these events. Coordinated efforts should include improving Heat-Health Alert Warning Systems, identifying key vulnerable populations within the City in preparation for heat related events, and coordinating with local health care institutions (e.g. Scripps Memorial Hospital) to increase extreme heat preparedness and resiliency.
- **Strategy 6:** Work with local and regional employers to ensure worker protection measures are in place for extreme heat events. Measures may include assurance of adequate water, shade, rest breaks, and training on heat risks for all employees working in the City.

- **Strategy 7:** Work with local businesses and institutions to provide a network of “Cool Zone” areas (i.e., cooling centers) for vulnerable residents to rest in air-conditioned environments during high temperature periods and heat wave events. Cooling centers can include locations like the Encinitas Library and the Encinitas Community and Senior Center. Work with the local school districts to ensure every school has air conditioning.
- **Strategy 8:** Participate in beach nourishment projects that maintain local wide sandy beaches. Encinitas beaches are considered regional “Cool Zones.” By maintaining the beach width, the City will be able to handle larger numbers of coastal visitors, when needed, keeping the public a safe distance from the bluffs.

5.3.2 Prepare for Changes in Precipitation Patterns and Water Supply

The City’s reliance on various regional water resources, including the San Diego Water Authority, will remain a critical issue for the City’s resilience to drought periods. The City will consider how future supply and demand for water resource in the region may change because of climate change. Considering the potential decrease in regional water resources available to the City due to decreases in annual precipitation, the City will implement the following strategies to increase the community’s resilience with regards to water supplies.

- **Strategy 1:** Coordinate with local and regional partners (SDWD, OMWD, SDCWA) to support and improve water conservation efforts and programs for City residents. Coordinate with these agencies to provide educational outreach to residents on how best to conserve water and reduce water demand.
- **Strategy 2:** Expand and/or improve the recycled water efforts currently in place at the San Elijo Water Reclamation Facility along with corresponding water conservation efforts to ensure that, when economically viable, all current and future city landscaping can source the majority of landscaping water needs from recycled sources.
- **Strategy 3:** Work with relevant water agencies, including SDCWA, OMWD, and SDWD, to evaluate current and future water supply systems and vulnerabilities and how water resources may be impacted by climate change.
- **Strategy 4:** Continue marketing and outreach program to promote participation in existing water conservation rebate and incentive programs in the region. Current programs for southern California include Water Smart San Diego (SDCWA), SoCal WaterSmart (Metropolitan Water District), and SDWD’s free sprinkler nozzle program.
- **Strategy 5:** Expand upon the City’s existing Water Efficient Landscape Regulation to promote the use of climate appropriate landscaping (e.g., xeriscaping) to reduce demand for potable water resources among City residents. Promote current funding available through the Save Our Water Turf Replacement Rebate Program sponsored by DWR.

5.3.3 Prepare for Increased Wildfire Risk

Like many communities in the region, the City will likely experience increased wildfire risk in the future. The information gathered in the Vulnerability Assessment has been utilized to develop key strategies for the City to implement regarding the increased wildfire risk as a result of climate change. The strategies focus on key areas within the City that are most vulnerable to wildfire risk, such as residences and businesses that are located in the UWI within the City. The City will implement the following strategies to address increased wildfire risk.

- **Strategy 1:** Coordinate with relevant agencies including OES, the California Department of Forestry and Fire Protection (CAL FIRE), and the Encinitas Fire Department to map and identify current and future land uses, neighborhoods, and infrastructure that are at a high risk of experiencing wildfire impacts.
- **Strategy 2:** Continue to update the MHMP every five years as required by the state to comprehensively plan for current and future wildfire risks within the City and work to implement all strategies in the City's current MHMP.
- **Strategy 3:** Update the Safety Element of the City's General Plan consistent with the Office of Planning and Research (OPR) General Plan Guidelines, which requires adopted safety elements to consider climate change and climate adaptation strategies pursuant to SB 379.
- **Strategy 4:** Work with relevant State agencies, including OES and CAL FIRE, to improve coordination for emergency services related wildfire and related events in the City. Consider the development of a Community Wildfire Protection Plan to increase community resilience too wildfire events.
- **Strategy 5:** Consider new development standards for City residents and businesses within the UWI, such as incorporating defensible space practices into landscape requirements for neighborhoods at increased risk of wildfire. Residential areas that should be considered for new standards include neighborhoods surrounding Lux Canyon, Saxony Canyon, the Manchester Preserve, and Escondido Creek.

5.3.4 Prepare for Increased Flood Risk

As discussed in Section 5.2, the City will experience a slight increase (0.7 inches a year) in average annual precipitation under a Low-Emissions Scenario, and an increase of 3.6 inches a year under a High-Emissions Scenario by 2099. Currently, the large majority of established development and associated infrastructure within the City is outside of the FEMA 100-year flood plain. Considering the noticeable increase in annual average precipitation under the High-Emissions Scenario for 2099, the City should begin planning for increased risk of flooding events. The information gathered in the Vulnerability Assessment has been used to develop specific strategies to help the City and prepare for increased flood risk. The City will implement the following proposed strategies.

- **Strategy 1:** Conduct a comprehensive assessment of all stormwater and wastewater infrastructure in the City and analyze how this infrastructure may be affected or compromised by increased risk of flooding events.

- **Strategy 2:** Coordinate with relevant agencies such as OES and the Encinitas Public Works Department to map and identify all critical facilities and infrastructure that may be compromised by increased flood risk. The City should plan accordingly for upgrades, relocation of facilities and infrastructure or identify beach nourishment projects to better prepare for increased risk of flooding events.
- **Strategy 3:** Coordinate with relevant agencies such as FEMA, OES and the Encinitas Fire Department to better plan and prepare emergency services required for flooding events including evacuation services, flood management services and recovery services.
- **Strategy 4:** Continue local and regional ecosystem restoration efforts that will result in increased climate resiliency for flooding events within the City.

5.3.5 Prepare for Coastal Erosion and Predicted Sea-Level Rise

Coastal erosion and sea-level rise is a significant threat to the community. The City should continue to incorporate coastal erosion and predicted sea-level rise into all planning programs and policies in the future. Consistent with the MHMP, hazard mitigation planning efforts should continue to incorporate the short- and long-term impacts that sea-level rise will have on the City, specifically in areas with development along the coastline. The City should be prepared for catastrophic failures along the coastline and be prepared to work with FEMA on existing conditions reports, failure reports and how to obtain FEMA funding to repair impacts because of flooding. Once completed, the City should use the San Diego Regional Coastal Resilience Assessment, developed by San Diego Foundation and ICLEI, as the guiding document for all planning efforts within the City related to sea-level rise. As discussed previously, sea-level rise may impact the City in several key ways including coastal erosion, cause property damage to development along the coast and cause damage to transportation, electrical, and wastewater infrastructure. The City will implement the following strategies to address risks related to sea-level rise:

- **Strategy 1:** Support and monitor ongoing analysis of sea-level rise data relevant to the City's planning efforts. Continue to incorporate the most up-to-date information on sea-level rise into relevant planning documents including the Safety Element of the City's General Plan.
- **Strategy 2: Develop a Coastal Resiliency Mitigation Report to coordinate FEMA, tsunami mapping and the CoSMoS predictions for sea level rise.** Utilize maps and FEMA Hazus software to estimate potential losses from tsunamis or sea level rise to map and display hazard data and the results of damage and economic loss estimates for building and infrastructure. By estimating losses, it provides a basis for developing mitigation plans and policies, emergency preparedness and response and recovery planning. Additionally, provide assistance to residents currently at risk of coastal erosions in preparing for future impacts.
- **Strategy 3:** Develop a comprehensive outreach strategy to receive stakeholder input and educate residents about sea-level rise and how the community can best prepare for these impacts.
- **Strategy 4:** Continue to implement current efforts focused on beach nourishment, coastal bluff improvements and wetland restoration, prioritizing projects that will mitigate the impacts sea-level rise including coastal erosion and saltwater inundation.

- **Strategy 5:** Coordinate with relevant agencies including FEMA, and OES to prepare and plan for the impacts of coastal erosion, sea-level rise, and coastal storm surge, continuously updating and utilizing the most relevant strategies and guidance provided by relevant agencies and institutions.
- **Strategy 6:** Continue to map critical infrastructure in the City that may be impacted by sea-level rise and work with City's Public Works Department to plan accordingly.

5.3.6 Community Education

While preparing for future climate change is essential to the safety and health of the Encinitas community, it is important to recognize that residents and businesses within the community should also be preparing for climate change. Future safety in the home and the success of a business will, in part, be dependent upon how prepared residents and businesses are for anticipated climate change. The first step in preparation is becoming aware of climate change impacts and how these may affect local neighborhoods, families, children and businesses. The City will develop programs to educate local residents and businesses about climate change and how to prepare at home, at school or in your workplace. Climate change education and outreach should have a particular focus on educating younger generations within the community, through school programs and age-appropriate engagement, as they are the residents that will be most impacted by future climate changes. The City will implement the following strategies to address community education about climate change:

- **Strategy 1:** Work with local community organizations to develop a climate change education outreach program focused on residents.
- **Strategy 2:** Work with local businesses and business organizations to develop a climate change education outreach program focused on local businesses and the economy.
- **Strategy 3:** Work with local schools, school districts and other educational organizations to develop a climate change education outreach program focused on children and future generations.

As shown in Section 5.3, the City will experience a series of considerable climate change impacts by 2050 and 2100. This assessment has shown that increased wildfire risk and sea-level rise are likely the most severe impacts to be experienced by the City. Several key areas in the City and surrounding areas, such as the San Elijo Lagoon and State Park, are projected to experience the highest sea-level rise and flooding impacts. Neighborhoods surrounding the City's open space areas, such as Saxony Canyon and the Encinitas Ranch Golf Course, are at increased wildfire risk. Considering the City's coastal geography, sea-level rise and coastal flooding will likely be the most expansive and persistent climate related impact the City will experience over the long term. Based on the foregoing, it is recommended that the City complete a comprehensive coastal vulnerability study to help better understand and provide guidance for future resilience planning efforts in the City.



CHAPTER 6

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Green = matched reference

Aqua = missing full reference

Pink = no citation in text

Chapter 2

City of Encinitas Climate Action Plan (2011 CAP)

Intergovernmental Panel on Climate Change [IPCC] 2014

(IPCC 2007)

U.S. Environmental Protection Agency [EPA] 2017

Energy Policy Initiatives Center, 2017

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CARB 2017

Chapter 5

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CEC 2017f

CEC 2017g

CEC 2017h

CEC 2017i

CNRA 2012

Dettinger 2011

DWR 2008

DWR 2013

ICLEI 2012

IPCC 2001

MHMP 2015

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USGS 2013